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ORIGINAL ARTICLES.

AN EPIDEMIC OF PARALYSIS IN CHILDREN, WITH A REPORT OF ONE HUNDRED AND TWENTY CASES.[1]

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DURING the past two months, through the intervention of Dr. C. S. Caverly, President of the Board of Health, and his colleague, Dr. H. H. Swift, I have been able to make some observations upon an epidemic of "Paralysis in Children" that occurred in the State of Vermont. The epidemic commenced late in June, increased in July, and culminated in August, and, though new cases are cropping up, the malady has now almost abated. I obtained the notes of ninety-one cases out of one hundred and twenty that were affected.

I feel at liberty to call the attention of this Association—a body that concerns itself chiefly with the health of the people—to this malady, wholly unknown in origin, and of uncertain nature. The record is fragmentary and imperfect. But it is by reason of its imperfection that it will mainly interest this meeting. Our aim is not so much to investigate the nature of disease as to examine into the conditions under which it prevails and the means that can be taken to prevent, limit, or even eradicate it. An additional reason is that, after as thorough a search of the literature as I could make, this is the first epidemic of the kind that has occurred in America.

I have not, without thought, decided to speak of these cases as "Paralysis in Children." They might be classed as cases of "poliomyelitis anterior acuta," if this would add in any degree to our knowledge, but such a term demands a consent that, with the imperfection of the material, many will be unwilling to make. Even in undoubted cases the use of such a term is open to objection, as it is merely a pathologic remark that does not entirely meet the case. In the cord of a child dead of this disease the lesion is not confined to the cells of the anterior horn; there may be a general hemorrhagic myelitis and there may be even meningeal involvement. But if we accept the definition of Osler, that this formidable name merely signifies "an affection occurring most commonly within the first three years of life, characterized by loss of power in certain muscles, and rapid atrophy," then we may, for the moment, leave names at one side and refer to some cases. As we all know, the nomenclature of disease requires revision to bring it at all into harmony with the amount of definite information, however small, that we really do possess.

At first, the belief was held that the outbreak was one of cerebro-spinal meningitis, and there were several cases presenting the characteristics of this disease. Besides, it is well known that this is an infectious disease that occurs not uncommonly in epidemic form. But from the cases that I shall submit, it must, I think, be clear that the malady is not to be explained by this method of reasoning. It will be noted in most of the cases that there were no typical symptoms of this disease; in some there were no symptoms at all, beyond paralysis. There was a general absence of marked retraction of the head and of opisthotonos; the sensory symptoms were not prominent; the headache was chiefly frontal; and, beyond some slight delirium of the ordinary febrile type, there were no psychic manifestations. The cutaneous symptoms were unimportant. While, in many cases, there were indefinite rashes, in only one were there petechiæ; in none, herpes labialis, mottling or purple spots, or the other undoubted cutaneous manifestations of "spotted fever."

Again, the sequelæ and complications were different. There is no account of pleurisy or pericarditis, and in only one case pneumonia. In only two cases was arthritis a factor, and in no case was there any persistent paralysis of any of the cranial nerves.

There was no impairment of hearing. The eye-symptoms were wholly of central origin. There was no ophthalmia, no conjunctivitis, no keratitis, or any other ocular inflammation; nor did any impairment of vision follow the attack. In these respects the malady departs from the type of cerebro-spinal meningitis, in which disease the eye-symptoms are marked and usually constant. Of thirty-two cases examined by Dr. Randolph these symptoms were present in twenty-eight, and on the authority of Wilson, Niemeyer, Knapp, and Kreitmair, it may be accepted that ocular symptoms predominate in all epidemics of cerebro-spinal

[1] Read before the American Public Health Association, September 28, 1894.

meningitis. Indeed, Hirsch affirms that "conjunctivitis is almost a constant condition."

The earliest case of which I could procure any record occurred on the 17th day of June, 1894, and I have taken the following note.

S. C., a boy five years old, complained on the 17th of June of headache, chiefly frontal, with nausea and vomiting; his temperature was 102°, the pulse 115. This condition continued for twenty-two hours, and was succeeded by soreness in the arms and legs, loss of reflexes, with gradually increasing paralysis, culminating after twenty-four hours in a completely powerless condition of both upper and lower extremities.

I will place by the side of this a later case:

A. B., a delicate girl of twelve years, with a slight left lateral spinal curvature, fell sick of an attack resembling indigestion, with coated tongue and marked constipation. Gradually, without any alarming symptoms, paralysis supervened, and in two days all the four limbs were rendered useless. After five weeks there was no sign of improvement in either arms or legs.

In general features the following cases are much alike:

Mildred T., a strong child of two years of age, on the 28th of August had an accession of fever, with a temperature of 103° and a pulse of 115, a coated tongue, constipation, and headache. These conditions persisted for four days, when it was observed that the right leg was completely paralyzed. It still remains in that condition.

Walter F., a well-grown lad, aged eight, was seen on the 21st of July, with a pulse of 140, a temperature of 105°, with nausea, vomiting, and diarrhea, and in a condition of extreme nervous tension, bordering upon delirium. Under acetanilid the temperature was reduced to 102°, but during the night two convulsions occurred, the temperature rose again to 105, and there was marked and noisy delirium. In the morning the condition was improved, and in four days the temperature was normal. There was now pain in the left arm, and with this exception, convalescence was well established, but the arm was completely paralyzed and hyperesthetic. Atrophy proceeded rapidly, and the limb became flaccid, soft, and flabby. The reaction of degeneration was soon manifest; then the nerves entirely lost their irritability and did not react at all to the interrupted current. The paralysis remained stationary for two weeks, and now shows some small improvement.

C. D., seven years old, was affected on the 18th of July, and for two weeks was in a general febrile condition, with delirium; there was general hyperesthesia and occasional convulsions. Gradually a paralytic condition of the upper and lower extremities supervened, which in a few days was confined to the left arm, and is now passing away after persisting for a month. For two weeks the patient was affected also with loss of speech.

In the following cases there were pronounced joint-symptoms:

The patient was a boy, seven years of age, who from the 4th of July had a temperature of 103.5° and a pulse of 120, lasting three weeks. The temperature now dropped to 97° and the pulse to 50. All this time there was obstinate constipation and general hyperesthesia. The knee-joints were painfully swollen, as well as the elbow-joints and shoulder-joints. Paralysis of the left upper and left lower extremities followed, and still persists.

Arthur A., aged four years, had been ailing for two weeks, and on the 22d of July was seriously ill. After three days there was fever and pronounced delirium; the head was thrown well back, and the muscles of the neck and back were painful and rigid. At the end of a week the temperature was normal, but both legs were drawn up, and the left knee was swollen and tender. For six days this condition persisted, but was gradually relieved. Paralysis with entire loss of usefulness followed, but after a month the limbs, though atrophied, appeared to be regaining their function.

Gowers holds that the pain is only "supposed to be in the joints, because it is produced by moving them, when it is really in the nerves, which are mechanically disturbed by the movement of the joints." In these cases the lesions appeared identical with those of acute rheumatism.

In the following cases the onset was peculiar:

Alice B., aged eleven years, a sturdy girl, on the 18th of July was affected, as a preliminary symptom, with double vision. For the following three days she was slightly unwell, and the next morning was unable to get out of bed. The left leg was completely paralyzed, the left arm slightly so. Fever with delirium followed for four days, when the symptoms abated, and finally all the conditions were relieved, and now the limbs show some improvement. It is to be noted that in the case of this girl the menstrual function was established during the progress of the disease. It is well known that the uterine function has a direct influence upon the cord, and *vice versa*.

Annie H., eleven years old, on the 15th of August was observed to have a coated tongue and symptoms of "biliousness," without fever or any other special symptoms. This continued as a slight indisposition for three days, when the child began to stumble, and on the 18th there was a complete paralysis of the left leg. This remained for ten days, when signs of improvement were noticed, which still continue.

In certain cases, as the following, there was no premonition of the attack:

An infant girl, suddenly and without symptoms, developed paralysis of both lower extremities. The condition persisted for two weeks, and went from improvement to complete recovery.

In view of the fact that in many cases of cerebro-spinal meningitis the lance-shaped coccus, similar

in all respects to the pneumococcus, has been found, and which Cornil and Babes regard as the cause of both diseases, it is worth remarking that pneumonia was present in only one case:

E. F., a boy aged four years, was affected on the 6th of August, after a slight preliminary illness, with paralysis of both legs, and two days later developed pneumonia. Both conditions subsided, and now the child is in a fair way of recovery.

In a few cases the onset was accompanied by symptoms of transient spinal meningitis. Gowers believes that each condition must be regarded as a coincident effect of a common cause.

In the following cases the symptoms of spinal meningitis were well marked:

Cortice C., aged twelve years, on the 8th of August had an attack resembling acute indigestion, and two days later both lower extremities became partially paralyzed. The child was away from home, and was now removed a distance of eighteen miles. The same night the temperature rose to 104.5°, the pulse to 130, and two convulsions occurred. There was undoubted retraction of the head and painful stiffness of the neck. The child was irritable and restless, with photophobia and undue sensitiveness to noises. The pupils were unequal, and there were well pronounced motor symptoms. There was tremor of the muscles, with clonic spasms of the legs and arms. The next morning the child was paralyzed in both legs. This acute stage passed off by the 15th of August, when the tongue was clean, the temperature normal, and the child was eating well, though there was some inabiiity to swallow, due to paralysis of the throat-muscles The paralysis, however, persisted, and on the 17th the child suddenly collapsed, with sordes on the teeth, the pulse imperceptible, the extremities cold, and with all the signs of impending death. Under heat and stimulants the child recovered in three days. Throughout the whole course there was an erythematous eruption which would vanish and then reappear. By the 28th of August one leg had improved, but the other remained much atrophied, and the signs of returning usefulness are indefinite.

In the following cases the issue was fatal:

Hilding A., a Swedish child, twenty months old, on the 31st of August was stricken with fever of 103° and a pulse of 120. The restlessness was extreme, the child moaning and tossing its limbs, but quite conscious. The head was firmly fixed, slightly retracted, and the pupils contracted. The next day the general symptoms were improved, but the child continued restless and in a highly excitable condition. On the 2d of September the fever had disappeared, and the restlessness increased, with clonic spasm, strong grinding of the teeth, and paralysis of the left leg. The next day the temperature rose to 104°, the spasm increased, and general paralysis supervened. The child died in the afternoon.

S. O., an Italian boy, four years old, on the 21st of July became sleepy and complained of headache. He was found to have no fever, but with a pulse of 45, slow, hobbling in character, and intermitting every fifth beat. This continued for four days, when a slight improvement was noticed. Strabismus occurred, but the child made a complete recovery, so far as symptoms were concerned, on the seventh day. He was then allowed to play in the hot sun with a goat, when all of the original symptoms returned—the headache, squint, halting pulse, and drowsiness. This was the last of August; by the 1st of September he was worse than at any previous time, but yet had no fever. The next day the knee-jerk was absent, but the plantar and the cremasteric reflexes were retained. The legs now became paralyzed, and by the 3d of September the paralysis was general, the eyes half closed, the pupils dilated and unequal, and a temperature of 105°. The child died at three o'clock the same afternoon.

Fannie H., aged six, had been ailing for a week, and on the 25th of July was noticed to be very ill, with a temperature of 104°, a pulse of 120, with pain in the head, back, and legs. The next day all these symptoms were increased in severity. Petechial spots appeared on the legs, and on the third day the paralysis of these limbs was complete. The next day the delirium was excessive, noisy, and continuous. The head was retracted, the pupils unequal, and the child was unable to swallow. The conditions grew worse, the paralysis became general, and the child died July 31st.

An infant boy who had been ailing for five days, with no special symptoms, on the 24th of July had a series of rapid convulsions, and in three hours died.

I was also able to see fifteen cases of children with slight digestive disturbance, but in all there were clearly marked nervous symptoms, but with no sequelæ. In others there was paralysis.

A. B., a Swedish child, four months old, was suddenly affected with indigestion and diarrhea, accompanied by a fever that continued for five days. The nervous tension was marked, and the child was fretful and restless. Suddenly paralysis developed in the right leg and continued for ten days, when complete recovery took place.

A. B., a boy, two years old, had an attack of acute indigestion, with marked nervous tension and general spasms. Under treatment with purgatives and sedatives the symptoms subsided; in four days the child was well.

I will now set forth the cases of six adults, the ages being respectively nineteen, twenty-four, twenty-seven, thirty-five, thirty-six, and seventy years; of these three died. In two the paralysis persists, and the man of seventy made a complete recovery.

G. E., thirty-six years of age, had for three weeks complained of lassitude, headache, loss of appetite, and nausea. On July 6th the headache was very pronounced and the prostration general; there was a coated tongue, but no fever and no acceleration of pulse. On July 11th the pulse was normal as to

rate and quality, but there was a temperature of 101°; the patient kept about his ordinary employment, that of an undertaker, until July 15th, when he was confined to bed. Pain in the back was the predominant symptom, but it subsided under dry-cupping and suppositories of morphin. On July 10th the pain was relieved, but during the day paralysis of the lower extremities supervened, with an erythematous eruption. In the afternoon the fever rose to 103°, and the pulse to 85. Next day at 4 o'clock in the morning the lungs filled up, the temperature became normal, the pulse 130, and eleven hours later, with progressive heart-failure, the patient died.

B. J., a male, nineteen years old, complained of pain in the head and back, with a pulse of 100 and a temperature of 102°. The fever subsided on the fourth day, the pulse fell to 56, and all pain had disappeared. The right arm became paralyzed, and by the next morning the pulse was 38, the temperature 97°, and the extremities cold. Complete paralysis developed during the day, and in the afternoon the lad died.

A. E., aged thirty-five years, on July 28th developed the characteristic symptoms of cerebro-spinal meningitis, with headache, chill, nausea, vomiting, a temperature of 102°, and a full, strong pulse. The muscles of the neck became painfully stiff, with retraction of the head, and flexing of the trunk backward, with rigidity of the muscles. This condition remained for a week, when a convulsive storm passed over the patient, and in two hours she was dead.

A. H., an adult male, aged twenty-four years, was affected on the 12th of July, the temperature being 100°, the pulse 65. In forty hours these symptoms subsided; then there was retention of urine for thirty-six hours, followed by complete paralysis of both legs, which still continues.

A. F., aged seventy, on the 4th of August was affected with severe pain in the lumbar region, high fever, nausea, and vomiting. This condition prevailed for thirty hours, then the temperature fell to normal, and the pulse to 58, accompanied by partial paralysis in the legs, which passed off in a week.

E. G., a female, twenty-seven years old, on July 8th complained of intense frontal headache, with painful neck and back. The temperature was 100°, the pulse 58, and without further symptoms the arms became paralyzed, but gradually recovered.

On the 10th of July a son of this woman was affected with pains in the head and back, a temperature of 104°, and a pulse of 130. After twenty-four hours the legs became paralyzed as well as the left arm, but they were restored to their normal condition in three days.

Notes upon a group of five cases follow:

1. A French boy, on June 26th was seized with slight fever, delirium, and constipation lasting for three days; then paralysis of the left arm and left leg ensued, lasting twenty days, followed by recovery.

2. An Irish girl, on June 26th had general symptoms as in the preceding case, with paralysis of the left lower extremity, which still continues.

3. An American girl, had on July 4th a fever of 105°, lasting for ten days, followed by paralysis of the lower extremities lasting two weeks, and ending in recovery.

4. An American girl, on July 5th had the initial symptom of double vision and loss of accommodation, with nausea and vomiting, but no fever. Paralysis of the left arm and left leg still persists.

5. A French boy, had fever for six days, and paralysis of the lower extremities, which still persists.

I now present notes upon three cases:

1. The patient was five years of age, and had fever, nausea, vomiting, but no eruption and no affection of the special senses; paralysis of the upper part of the right thigh still persists.

2. A child of one year, had on July 28th the first symptom, hyperesthesia, lasting for forty-eight hours; then nausea, vomiting, fever, paralysis of the right leg and right arm, which still persists, though somewhat improved.

3. On August 4th a child one year of age had the same general symptoms, with paralysis of the right arm, which remains permanent.

I add notes upon four more cases:

1. On August 1st a child was seized with fever, nausea, and vomiting, lasting for three days, when the temperature became normal and the pulse 60. Paralysis of the right leg and right arm ensued, persisting for two weeks, and then clearing up.

2. On August 3d an adult male, aged thirty-six, had pain in the back, a pulse of 110, a temperature of 102°, with paralysis of the left arm; recovery was complete in two weeks.

3. On July 13th a brother and sister had fever, pain in the head and back, lasting three days, with paralysis of the right arm lasting ten days, followed by recovery.

In four cases, all of which occurred in July, the ages being one, six, thirteen, and fourteen, the paralysis was in the lower extremities; retention of urine occurred in two cases, and paralysis still persists.

In two cases occurring on June 20th and July 3d the children were one year and nine months and two years and seven months old respectively. The general symptoms were fever, nausea, vomiting, diarrhea for four days, with slight skin-symptoms. In one case the right arm was rendered wholly useless, and the left arm and left leg partially so; in the other case the paralysis affected both legs. In the latter case the condition persisted for five weeks, but in the former it is permanent in the right arm and shoulder and in the left shoulder and upper left arm.

In nine cases that occurred between July 15th and August 15th the ages of the children were be-

tween one and five years. In all there were eruptions on the skin and a temperature ranging from 101° to 104°, and lasting from two to five days. In only two cases was the eruption extensive, and in no case was there desquamation. The paralysis was confined to the lower extremities, and involved chiefly the extensors and abductors, but was never complete; hyperesthesia was present invariably. In six cases recovery took place, and in the other three improvement was noticed.

In ten cases occurring between July 5th and July 18th the ages ranged from eighteen months to four years; there was fever, but no convulsions and no affections of the special senses. The lower extremities in all cases were affected, and in three the condition is permanent, while some made a recovery more or less complete. In one case there was retention of urine.

In seven cases occurring during the month of June the ages ranged from a few months to nine years. The fever was slight, the temperature averaging 100°. In three cases there was a papular eruption, spasm of the facial muscles, and in all these were pains in the legs. The general eruptions persisted for a week, and were followed by paralysis of the lower extremities. None of the cases was fatal, and in all there are signs of improvement.

In eight cases occurring between the middle of July and the middle of August the ages varied between ten and thirty-five years. In two the paralysis was general, and the result was fatal. In two there were erythematous eruptions, in one convulsions, and all had fever.

I have given notes of ninety-one cases. By the most careful estimate I could make there had been in all one hundred and twenty persons affected.

The following table shows the results reduced to percentages:

Fatal cases	13
Recovered	25
Improved	30
Unimproved	32

The muscles in every marked case showed that the degenerative reaction to the constant current was increased. The muscles were variously affected. In some cases the whole arm was paralyzed, in some only the intrinsic muscles of the palm. But the combinations of the different groups affected were endless. After an exhaustive tabulation of groups I was unable to discover any combination that might be looked upon as the natural order of the paralysis. The deltoid was usually affected, but with it, or alone, were the supra-spinatus, infra-spinatus, triceps and biceps, the supinators and pronators, in endless combinations. In one case all the muscles of respiration were paralyzed and the breathing was abdominal. In the legs the extensor group was most frequently affected, and sometimes there was functional association. When the paralysis was partial the muscles below the knee suffered most, and when the condition of foot-drop was pronounced the muscles of the thigh would be found in good condition. The paralysis in every case was motor, and the only disturbance of sensation was hyperesthesia.

The distribution of the paralysis was as follows:

Left arm alone	2
Right arm alone	4
Both arms alone	2
Right leg alone	7
Left leg alone	20
Both legs alone	45
Left leg and left arm	8
Right leg and right arm	3
Both legs and left arm	2
Both legs and both arms	4
Right thigh alone	2

It would be hard to discover a region in which a disorder had less license to become epidemic. The whole district in which these cases occurred lies upon a series of terraces, and increased safety did not come with elevation. Indeed, four cases occurred on the very ridge of the Green Mountains at an elevation of 1500 feet. The line of dwellings in which these patients lived extended over half a mile, and the water-supply was different in each of the four cases, namely, from springs out of the mountains.

The infection during my inquiry was confined to a definite area of fifteen miles in length and twelve in breadth. The eastern limit was the range of the Green Mountains, but on the other three sides there was no natural boundary. The city of Rutland is in the center of the area.

I am convinced that the geologic formation of a district has much to do with the dissemination of disease. Country districts only remain healthy when the territory is enormously large for the number of habitations. When we approach the conditions of village-life we have as a rule the condition most suitable for the propagation of disease. The natural drainage of the soil is of the highest quality but of the most limited capacity, and when once there is an infected focus the very excellence of the drainage increases the danger. It is in the country, for example, that we have the most virulent types of diphtheria, scarlet fever, and typhoid. In the present case, though, I am unable to mark out any definite line upon which the epidemic has marched, I made a careful examination of the geologic conditions, which I wish to record for future reference should similar outbreaks occur in other localities. The region has great geologic interest on account of the faults and dislocations in the earth's crust and the profound breaks in the strata of the whole

district. The great St. Lawrence and Champlain fault, or the Great Appalachian, as it is sometimes called, culminates in this district. It extends all the way from Gaspe to Quebec City, and crosses the boundary at High Gate Springs, proceeding through Vermont to Alabama, where it appears to die out. This great fault, accompanied by numberless smaller ones, must form gaps and reservoirs into which contaminated waters can fall and become breeding-places and again burst forth in the most unexpected spots. It is not the surface-water alone that carries infection, as we know that spores are independent of sunlight and warmth. The whole region is full of springs, as most faulty districts are, and the gaps that yield water may just as likely receive it after it has drained through the surface-soil. Again, the ridge of the Green Mountains marks the eastern boundary of the infected area, and the further slope remains entirely free from disease and free from geologic faults. Again, this region has undergone in the past great metamorphoses, and as the physical agencies are still at work the chemic and physical reactions must affect the soil and water. Further than this one cannot go.

The data from which my conclusions as to the influence of climate are drawn are obtained from Mr. William Line, the observer at Northfield Station of the Bureau of Vermont, and from Mr. Mark Harrington, Chief of the Weather Bureau at Washington. The total rainfall for the months of June, July, and August amounted to only 6.58 inches, the amount for the same period of the preceding years being 11.95, 15.04, and 10.02 inches, or an average of 11.2 for the last forty-seven years.

The average temperature for the same period in 1894 was, 64.3°; 1893, 64.4°; 1892, 65.2°; 1891, 62.9°, or an average of 65.4° for the last forty-seven years, and the relative humidity was for 1894, 79.9; for 1893, 78.6; for 1891, 80.

The summer was dry and hot, the springs were scanty, and the surface water low. The observations in detail are:

Month.	Average temperature.	Relative humidity.	Rainfall.
June, 1891 . .	61.4°	79	2.04
July, " . .	63.0	78	3.20
August, " . .	64.0	83	4.78
June, 1892 . .	64.9	75	5.66
July, " . .	66.0	75	2 88
August, " . .	64.8	86	6.50
June, 1893 . .	65.0	75	2 07
July, " . .	63.8	77	3.74
August, " . .	64.6	83	6.14
June, 1894 . .	64.5	80.1	1.71
July, " . .	67.2	77.4	1.64
August, " . .	61.2	82.4	3.23

Neither overcrowding of habitation nor any of the evils usually accompanying or flowing from this condition were factors in the present case, as only in four families was more than one member affected. It was quite usual for children to sleep with those who were affected and themselves remain entirely free from the disease. No isolation was practised, nor would such precautions appear to be of the slightest value. Any statistics of the nationality of those affected would be useless, as the occurrence of cases was entirely independent of place of birth, and the population is intimately mixed. In one locality there are nearly a thousand men employed in marble quarries, many of them Italians, but in this large colony I found only two cases. Indeed, the brunt of the disease appears to have fallen on the purely rural portion of the community. Amongst the cases were found American, Swedish, Italian, French, Irish, and Jewish children.

Nor was anything discoverable in the domestic and personal hygiene of those attacked. The houses are all detached, and in many cases there was nothing in the nature of privy or cesspool found; neither had penury any part in the epidemic. The district is one of the most thriving in the United States, and has been settled for a century and a half. The food-supply and the milk-supply are above reproach, being drawn from the neighboring farms or from the farms on which the patients lived. The veterinary surgeons have remarked nothing unusual in the condition of the cattle; but twelve horses died of a malady about which the veterinary surgeon to whom I applied was unable to give any information. It was called cerebro-spinal meningitis. It is easy to reproach one with lack of zeal and scientific enthusiasm on account of scarcity of pathologic data, but in every case of death up to the present autopsies were refused, even though the most urgent efforts were made. The friends of the patients refused to have their objections overcome by persuasion, by appeals to their reason, or by love of gain, even by pressure and intimidation. But a malady extensive and fatal in its nature should not go unstudied, nor should its lessons be buried with the dead. One private person cannot accomplish much because of want of authority and want of facilities. Besides, no one person combines sufficient clinical skill and experience with bacteriologic knowledge and pathologic technique to deal adequately wilh a matter of soserious a nature. Instruments get out of adjustment, batteries fail, and sterile refinements are hard to preserve in a country district.

But the greatest difficulty of all is lack of authority. In the Province of Quebec, though we are an anomaly to the rest of the continent, we do much better. Before the recent session of the Legislature commenced the Board of Health took counsel as to what changes in law were necessary, but they found that the authority as existing was absolute. The

board may examine under oath and compel witnesses to appear in the manner required by the Code of Civil Procedure, and perform autopsies when desired. In the State of Vermont there is an efficient Board of Health constituted under the act of 1886, but it had little more than advisory powers till 1892. Since then the board has power to promulgate more stringent rules and the authority to enforce them. The defect consists in this: there is no adequately equipped laboratory and no organized system of investigating such an epidemic as that in question. There is no authority that can supply the demand for autopsies, and without the information to be gained in this way, one is working largely in the dark.

In every State and Province there should be a complete equipment in staff and appliances for the investigation of disease, and one of the main purposes of this paper is to emphasize the necessity of such an institution, as well as to call attention to an epidemic so unusual in its occurrence, that, as I have said, it has not been noted before in this country.

I have confined myself to a statement of facts, and have purposely refrained from giving expression to any theories; that can be done more adequately in another place when the work in hand is at an end and the positive or negative value of the pathologic and bacteriologic results is obtained.

THE ATTENUATED BACILLUS TUBERCULOSIS: ITS USE IN PRODUCING IMMUNITY TO TUBERCULOSIS IN GUINEA-PIGS.

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APPARENT IMMUNITY TO TUBERCULOSIS IN GUINEA-PIGS.

IT is well known that a number of the pathogenic bacteria decrease very greatly in virulence when cultivated for a long time outside of the animal body. This fact has also been noticed in the case of the bacillus tuberculosis, and the literature is full of references to the decrease in virulence of the tubercle bacillus and the way of securing this, but some facts have been developed in this connection in my work on tuberculin, in a new direction, which should be recorded.

Cultures with which I started several years ago were obtained through the kindness of Dr. Trudeau, of Saranac Lake, N. Y., and were the second generation on blood-serum from a rabbit. After growing for several generations upon glycerin-agar, about two months to each generation, the culture was transferred to glycerin beef-broth, which was to be used as a source for tuberculin. After the fourteenth generation I noticed that the guinea-pigs that were always kept inoculated with tuberculosis, to test the tuberculin, did not succumb nearly as readily, and in the case of the fourteenth generation it required six months before the disease developed. I, consequently, inoculated a number of guinea-pigs with the seventeenth, eighteenth, nineteenth, and twentieth generations of this germ, which was alive and would grow very readily on the liquid media. Some of these pigs inoculated had previously been treated by an injection of tuberculin; the others had never been used. After some months those that had been inoculated with the attenuated germ remained quite well, and one was chloroformed, and the autopsy showed that it was free from disease.

In order to see if this might be accidental I then had nine pigs inoculated, four checks, four pigs previously inoculated with the attenuated germ, and one pig that had received tuberculin by feeding. These were all inoculated in the side with the material from the gland of a tuberculous cow that had just been killed. After seven weeks the checks were all found dead from tuberculosis. The other animals appeared perfectly well. One was accordingly chloroformed, and although very careful examinations were made no disease could be detected. Even the local lesion that was produced where the material had been injected had entirely healed. The animals were apparently immune.

Some experiments that had been made earlier with tuberculin prepared from a younger growth did not show that this material had a positive value in preventing disease, although it retarded it. As the preparation of tuberculin, however, continued, I noticed that the tuberculin was much more constant in reaction and that a larger amount of the active principle was yielded by cultures of the older germ.

At this time I had at the Experiment-station of the Bureau the calf of a tuberculous cow, which, however, although the mother was badly diseased, did not respond to an injection with the tuberculin. The calf was then drenched with 100 c.c. of a growing active liquid culture of this attenuated germ, the twentieth generation. After three months the calf was again injected with tuberculin, and, failing to respond, was killed. The autopsy showed the animal to be perfectly healthy.

Another healthy Southern cow received into a vein an injection of the same generation from this liquid culture, in July. On November 20th this animal, which was rather thin and had an initial temperature of 103° F., was injected with tuberculin, but did not show any reaction. Another animal known to be tuberculous, injected at the same time, with the same-sized dose of tuberculin, showed a good reaction. The cow which had received the

injection of attenuated culture had a small lump, the size of an egg, on the side of the neck, where inoculated. The diagnosis of no tuberculosis, as based upon failure of reaction to tuberculin, will be confirmed or disproved by an autopsy later. These experiments were kindly made for me by Dr. Schroeder.

So far as I have been able to find, the first note of successful cultivation of the tubercle-bacillus upon liquids free from albuminoid matter was made by myself in the *New York Medical Journal* of March, 1893. Since then Uchinsky, Proskauer, and others have used similar media. None has, however, reported a better growth than that obtained by a slightly modified form of the original culture-medium. It required some time until I could persuade the germ to grow in this liquid, but after considerable coaxing it will now multiply as well here as on glycerin-peptonized beef-broth, the fourth generation having become accustomed to the change of food.

The formula that I have found eminently adapted and used may be repeated here:

Water	1000 cc.
Glycerin	70 grams
Acid pot. phos.	1 gram
Ammonium phos.	10 grams
Sodium chlorid	10 "
Asparagin	3 "
Magnesium Sulphate	0.2 gram

After a certain amount of growth has appeared in a definite volume of media the growth will entirely cease. The germ has exhausted the supply of nutritive material or eliminated enough poison to check its own development, and, although the germs may still float on the surface of the liquid, after from three to four months there is practically no growth in the liquid. Further, there is a distinct and peculiar odor generated in the culture-media. This is due to a fatty acid which is difficultly volatile with steam. The reaction of the media when inoculated is slightly alkaline. As the growth increases it becomes less so, and finally it is acid in reaction.

In order to see if the apparent loss of virulence of the germ might be due to some of its products contained in the body of the germ, two guinea-pigs were inoculated with the twenty-third generation of the germ, after the germs had been carefully and thoroughly washed with sterile water to remove all products. These pigs, after two months, are still well. The bacillus grown on purely artificial media might naturally be supposed to be still more attenuated than that grown on the ordinary culture-liquid. To test this, some of these germs were used to inoculate guinea-pigs, with the same results as those already noted.

In the case of a disease like tuberculosis, in which the incubation-period is often an exceedingly long one, there is a possibility that what now appear immune animals may in time succumb. In view of the fact, however, that all of the checks died so promptly, so long a time has elapsed since, and that all the other animals remained well, it is fair to presume that we have here a true immunity secured by an attenuated germ.

The following notes give the experiments in detail, and in the table they can be noted in a comprehensive form.

The autopsies are not given in full, as they appeared superfluous.

January 18, 1894. Guinea-pigs, Nos. 27, 28, 29, and 30, about three-quarters pound weight each, were inoculated with an emulsion of an agar-culture of tuberculosis, receiving 0.25 c.c. each, in the thigh. This was the eighteenth generation of the particular germ. On February 13, 1894, No. 27 was used to test some tuberculin, and gave a good reaction, although apparently in good health. February 15, 1894, No. 28 was found dead, but the autopsy did not reveal any signs of tuberculosis. No. 27 was found dead on March 19th, two days after it had been fed a large amount of tuberculin. The autopsy did not reveal the presence of any tuberculous lesions. Nos. 29 and 30 were subsequently, within six months, chloroformed and examined, but no signs of tuberculosis were apparent.

February 16, 1894. Healthy guinea-pigs, Nos. 115, 113, 128, and 127, were fed varying doses of tuberculin, from 3 c.c. to 12 c.c. Nos. 127 and 128 succumbed to the feeding, but this proved to be due to the glycerin with which the tuberculin had been mixed.

On March 30, 1894, Nos. 114, 115, 113, 109, and 112 were inoculated with 0.1 c.c. of tuberculosis emulsion from the seventeenth generation of a liquid culture. June 5, 1894, No. 115 was chloroformed, but the autopsy did not reveal any signs of the disease. October 1, 1894, No. 114 was found dead outside of the cage; it had been killed by the rats and the head was badly eaten. The animal was in good condition and fat, and the autopsy did not reveal any signs of tuberculosis. There was a little thickening of the skin and a small non-tuberculous lump at the point of inoculation.

During April and May, Nos. 113 and 112 were fed on three different dates with small doses of tuberculin, but did not show any reaction. Both of these pigs are apparently in good health and entirely well at the present writing, eight months after inoculation. During this time guinea-pig No. 109 had been chloroformed, September 29, 1894, and examined without any signs of disease being apparent. The seventeenth generation of this germ was evidently too attenuated to cause death.

April 4, 1894. Guinea-pig No. 110 was fed with 9 c.c. tuberculin, diluted with sterile water without ill effect.

February 19, 1894, pig No. 122 was inoculated with 0.25 c.c. of tuberculosis culture, the seventeenth generation, and on April 4, 1894, was fed with 25 c.c. tuberculin. The pig was rather thin;

TABLE SHOWING EFFECT OF ATTENUATED TUBERCLE CULTURES AND FEEDING TUBERCULIN IN GUINEA-PIGS, RABBIT, AND COW.

No. of animal.	Fed tuberculin.		Injected tuberculin.		Inoculated with artificial culture attenuated tubercle bacilli.		Fed tuberculin.		Injected tuberculin.		Inoculation with tub. gland.	Reinoculated with attenuat'd culture.	Dead.	Chloroformed.	Autopsy.		Present condition.
	Date. 1894	Am'nt.	Date. 1894	Am'nt.	Date. 1894	Amount and generation.	Date. 1894	Am'nt.	Date. 1894	Am'nt.	Date. 1894	Date. 1894	Date. 1894	Date. 1894	Date. 1894	Condition.	Date of appearance, Nov. 28, 1894.
Guinea-pigs 27	.....	.....	.....	.....	Jan. 18	¼ c.c. 18th gen.	Mar. 17	24 c.c.	Feb. 13	¼ c.c.	.....	.....	Mar 19	.....	Mar. 19	Poisoned with tuberculin; no tuberculosis.	
28	.....	.....	.....	.....	" 18	"	.....	.....	.....	.....	.....	.....	.....	.....	Feb. 15	.....	
29	.....	.....	.....	.....	" 18	"	.....	.....	.....	.....	.....	.....	.....	Mar. 19	.....	Organs normal.	
30	.....	.....	.....	.....	" 18	"	.....	.....	.....	.....	.....	.....	.....	.....	.....	"	
115	Feb. 16	6 c.c.	.....	.....	Mar. 30	¼ c.c. 17th gen.	.....	.....	.....	.....	.....	.....	.....	June 5	June 5	"	
113	" 15	4 c.c.	.....	.....	" 30	"	.....	.....	.....	.....	.....	.....	.....	.....	"	.....	Well, fat, and in good condition.
110	April 5	9 c.c.	.....	.....	.....	.....	.....	.....	.....	.....	July 29	.....	Oct. 29	.....	Oct. 29	Badly tuberculous.	
141	Mar. 8	18 c.c.	.....	.....	May 16	¼ c.c 20th gen.	.....	.....	.....	.....	July 29	.....	.....	.....	.....	.....	Well, fat, and in good condition.
142	" 8	26 c.c.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	April 11	.....	April 11	Tuberculin-poisoning.	
136	.....	12 c.c.	.....	.....	" 16	20th gen.	.....	.....	.....	.....	July 29	.....	.....	Oct. 1	Oct. 1	Organs normal.	
135	.....	.....	.....	.....	" 16	"	.....	.....	.....	.....	"	.....	.....	.....	.....	.....	Well, fat, and in good condition.
137	.....	.....	.....	.....	" 16	½ c.c. 20th gen.	.....	.....	.....	.....	"	.....	.....	.....	.....	.....	" " " " "
213	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	"	.....	Sept. 11	.....	Sept. 10	Badly tuberculous.	
214	Checks	.....	.....	.....	.....	.....	.....	.....	.....	.....	"	.....	Sept. 11	.....	Sept. 11	"	
215	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	"	.....	Sept. 21	.....	Sept. 21	"	
133	.....	.....	Mar. 24	½ c.c.	.....	.....	.....	.....	.....	.....	"	.....	.....	Sept. 17	Sept 17	"	
210	.....	.....	.....	.....	July 27	½ c.c. 22d gen.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Well, fat, and in good condition
211	.....	.....	.....	.....	" 27	"	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Well, fat, and in good condition.
125	.....	.....	.....	.....	Feb. 19	¼ c.c. 19th gen.	.....	.....	Mar. 24	¼ c.c.	.....	.....	.....	.....	.....	.....	" " " " "
122	.....	.....	.....	.....	"	"	April 4	25 c.c.	.....	.....	.....	.....	April 9	.....	April 9	Tuberculin-poisoning.	
121	.....	.....	.....	.....	"	¼ c.c. 17th gen.	.....	.....	.....	.....	.....	May 16 ¼ cc.	.....	.....	.....	.....	Well, fat, and in good condition.
120	.....	.....	.....	.....	"	0.2 c.c. 17th gen.	April 4	3 c c.	.....	.....	.....	.....	.....	.....	.....	.....	Well, fat, and in good condition.
119	.....	.....	.....	.....	"	"	.....	.....	Mar. 24	½ c.c.	.....	.....	.....	.....	.....	.....	Well, fat, and in good condition.
118	.....	.....	.....	.....	"	¼ c.c. 17th gen.	.....	.....	.....	.....	.....	.....	Mar. 19	.....	Mar. 19	Organs normal.	
114	.....	.....	.....	.....	Mar. 30	"	.....	.....	.....	.....	.....	.....	Oct. 19	Killed by rats.	Oct. 1	No tuberculosis.	
109	.....	.....	.....	.....	"	"	.....	.....	.....	.....	.....	.....	.....	Sept. 29	Sept. 29	"	
112	.....	.....	.....	.....	"	"	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Well, fat, and in good condition.
Rabbit 141	.....	.....	.....	.....	Feb. 23	17th gen.	.....	.....	.....	.....	.....	July 27 ¼ c.c. 20th gen.	.....	.....	.....	.....	Well.
Cow 917	.....	.....	.....	.....	July	20th gen. in the vein.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Tested with tuberculin; no reaction November 20, 1894.

there was a lesion the size of a pea at the point of inoculation, but the temperature was normal. April 9, 1894, this pig, No. 122, was found dead. The organs were apparently normal, except that the bloodvessels of the stomach and intestines were much congested. The pig had evidently been poisoned with the tuberculin; the contents of the intestines were thick and mucus-like.

February 19, 1894. Guinea-pig No. 121, weight 13 ounces, was inoculated with 0.25 c.c. tubercle culture. May 16th it was well and was reinoculated with 0.25 c.c. tubercle culture.

February 19, 1894. Guinea-pig No. 118 was inoculated with 0.25 c.c. of tubercle culture, the seventeenth generation. March 19th, this pig was found dead, but the autopsy did not reveal any signs of tuberculosis.

February 19, 1894. Guinea-pig No. 119, weight 14 ounces, received an injection of 0.2 c.c. tubercle culture, and on March 24, 1894, an injection of 0.5 c.c. of tuberculin. The temperature-reaction was very slight.

February 19, 1894. Guinea-pig No. 120, weight 14 ounces, was inoculated with 0.2 c.c. tubercle culture. On April 4, 1894, it was fed 3 c.c. of tuberculin. At this time it appeared to be ill, but did not show any reaction to the tuberculin, and the next day was quite well.

February 19, 1894. Guinea-pig No. 125 was inoculated with 0.25 c.c. tubercle culture. March 24th it received an injection of a small quantity of tuberculin, which caused a characteristic reaction.

March 8, 1894. Guinea-pig No. 141, three-quarters of a pound in weight, was given 18 c.c. of dilute tuberculin.

March 8, 1894. Guinea-pig No. 142, healthy, was fed 27 c.c. of tuberculin, but did not show any reaction. April 11, 1894, this pig was dead; the lungs were hemorrhagic, and the bloodvessels of the stomach and intestines much congested from tuberculin-poisoning.

March 12, 1894. Guinea-pig No. 136, healthy, was fed 12 c.c. of tuberculin.

May 16, 1894. Guinea-pig No. 135, weight one pound; guinea-pig No. 141, weight one pound; and guinea-pig No. 136, weight one pound, all received 0.25 c.c. tubercle culture, the twentieth generation. Guinea-pig No. 137, weight one pound, received 0.5 c.c. of the twentieth generation of tubercle culture. Nos. 141 and 136 had both been fed tuberculin once, the others had never been used.

July 27, 1894. Guinea-pigs Nos. 210 and 211, weight one pound each, received 0 5 c.c. of attenuated culture of tuberculosis, the twenty-second generation. At the present writing neither of these animals shows the least signs of tuberculosis.

July 29, 1894. Pigs Nos. 135, 136, 120, 110, 141, 125, and checks, healthy pigs, Nos. 213, 214, 215, and 133, were all inoculated for me at my request by Dr. V. A. Moore, with the material from the tuberculous gland of a badly-diseased cow, No. 286. The inoculations were made beneath the skin of the side. On September 11th checks Nos. 214 and 215 were both found dead, and the autopsy revealed extensive tuberculosis in lungs, liver, and spleen. September 21st, check No. 213 was found dead, the autopsy showing advanced tuberculosis. September 17th, guinea-pig No. 133 was chloroformed for examination, which revealed extensive tuberculosis.

October 13, 1894. Guinea-pig No. 136, one that had been inoculated in May with the attenuated culture, and subsequently inoculated with a tuberculous gland, was chloroformed for examination. Not a sign of disease could be detected and the local lesion from the inoculation had almost healed.

October 29, 1894. Guinea-pig No. 110 was found dead. This was a pig that had been fed upon tuberculin on April 4, 1894, and inoculated with the gland July 29, 1894. The autopsy showed advanced tuberculosis. The other pigs that had been inoculated with the attenuated culture and then the active virus, Nos. 135, 120, 141, and 125, are, at the present writing, quite well, and show no signs of disease. I may find that some of the animals that are now considered immune will eventually succumb to the disease. This, however, does not appear probable, as pig No. 136, examined after the death of all the checks, did not show any signs of disease.

Further, animals No. 137, inoculated with the twentieth generation May 16th, and No. 112, inoculated March 30th; Nos. 120 and 119, inoculated February 19th; No. 113, March 30th; and No. 121 on February 19th, and again on May 16th, are, at this writing, to all appearances perfectly well, having lived from six to nine months after the inoculation.

February 23d, rabbit No. 141 was inoculated with 0.25 c.c. of tubercle culture of the seventeenth generation. July 27th, this same rabbit was reinoculated with the twentieth generation of a tubercle culture, 0.25 c.c. being used. Still the animal is apparently well.

These experiments which, of course, in connection with so important and troublesome a disease, can be regarded as preliminary only, and must be confirmed by a large number of similar ones, serve to show that by the use of attenuated tubercle-bacilli and their products we may be able to control pulmonary tuberculosis. If the twenty-second generation has shown such attenuation and produced so much resistance, then the thirtieth generation, or later, should give still more satisfactory results.

An examination of the table and accompanying notes will also show that tuberculin, when fed in very large doses to supposedly diseased or to healthy pigs, may cause the death of these animals by poisoning. The amount necessary varies from twelve to twenty times the quantity that would give a reaction in a tuberculous cow.

The digestion-experiments referred to in my report, in *Bulletin No. 7, Bureau of Animal Industry, Department of Agriculture*, have shown that the action of tuberculin upon diseased animals is not affected after twenty-four hours in a hydrochloric-acid pepsin-solution, nor by warming with acetic acid. On the other hand, in two cases noted, feeding the tuberculin in small doses, while it did not

prevent the disease, apparently retarded it. Possibly a combined feeding of tuberculin and the inoculation with the attenuated germ may be found more useful than either alone.

The fact must not be lost sight of that the number of bacilli injected into an animal may cause great differences in the length of time of the development of the disease. There could be no error of this sort, however, in the experiments recorded, as the emulsion of virulent and attenuated cultures used for inoculation were prepared in the same way, and a larger quantity of the attenuated culture was used than is necessary in case of a more virulent one to produce death, in five to six weeks.

What conclusions may be drawn from these experiments? We have guinea-pigs made apparently distinctly immune to an active tuberculous virus by the use of an attenuated germ. We have guinea-pigs in which a single injection of a small quantity of tuberculin increased, perhaps, the subsequent immunity secured by injection with the attenuated culture. We have other pigs the immunity of which has not been tested, it is true, by an active virus, but which were inoculated with the attenuated culture many months ago, and are still well, and in which an autopsy of other animals treated in exactly the same way and at the same time showed no signs of disease.

Recently Viquerat claims to have been able by means of subcutaneous injections of the serum of the ass, an animal naturally immune to tuberculosis, to effect cures and improvement in the disease in man. Our attenuated germ may possibly prove very valuable in checking or controlling tuberculosis in animals, especially cattle.

ZINC STEARATE IN THE TREATMENT OF ATROPHIC RHINITIS.[1]

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CONSIDERATION of a disease so prevalent, so disgusting and so rebellious to treatment as atrophic rhinitis appeals at once to both the general practitioner and the specialist. Perhaps from a feeling of incapacity or of indifference these cases are often dismissed with general directions and a solution to use in an atomizer or as a douche. In consequence they migrate from one physician to another, often ultimately to fall into the hands of some one of the numerous charlatans that flock to our large cities. But with some little care and perseverance much can be done. It is with the view of recording my experience with a comparatively new drug that this paper has been prepared. The plan of treatment outlined commends itself because of its exceeding simplicity, and it is within the power of every one to apply. If, as seems probable, it merely arrests the destructive process and renders the patient comfortable and unobjectionable to his friends, it will have served us well. I have taken the liberty of prefacing my remarks with a few words on the nature and general management of the disease, feeling that by so doing the subject would be better elucidated.

The name atrophic rhinitis would imply an inflammatory condition with an atrophic element. When the cases come under our observation, usually there is rarely much of an inflammatory condition present, but there can be no doubt that the early history of these cases is one of inflammation. Bosworth[1] has clearly demonstrated, and I believe his views are accepted by a large number of rhinologists, certainly in the United States, that the disease is the successor of that affection in children in which there is a purulent or muco-purulent discharge from the nose, and named for this reason purulent rhinitis.

The atrophic element in a case is at once noticeable. Dilating the alae of the nose, we observe a roomy nasal chamber, the turbinates shrunken often to obliteration of the lower turbinate, and contracting the middle so as to give an unobstructed view through the nasal chambers to the posterior wall of the pharynx, a state incompatible with healthy function of the nasal chambers. We also observe these turbinate bodies, and especially the middle, covered by thickened crusts, which, upon removal leave a reddened surface and rarely an ulcerated spot on the mucous membrane. Before our investigation has reached this stage we are conscious of an all-pervading, disgusting odor emanating from the nose, which is likely to be increased on detaching the crusts. This has given rise to the name "ozena," a term which, while highly descriptive of one symptom, *i. e.*, stench, cannot be used as a synonym. Ozena simply represents a condition present in many cases of the disease, but not in all. The same condition is present in syphilitic and in carious disease, both of which are entirely distinct and will not receive consideration in the present article.

These two symptoms, the crusts and the ozena, give the keynote to the management of this intractable disease. When we obtain a clear conception of their production and can apply means for their permanent eradication we have solved the difficulty. In making this assertion I have not lost sight of the fact that several important physiologic purposes of the nasal chambers have been abrogated when this disease is well marked. Though a firm

[1] Read at the eleventh annual meeting of the New York State Medical Association, held in New York, October 10, 1894.

[1] Bosworth: Diseases of the Nose and Throat: the Nose and Naso-pharynx, p. 162.

believer in the rôle of the turbinate bodies in adding to the moisture of the respired air, so ably enunciated by Bosworth, and in their salutary office in filtering deleterious matters in the inspired air, and also cognizant of the important office of the nasal mucous membrane in secreting mucus, yet I cannot but believe that these offices can, in a measure, be compensated for, and indeed, as we shall see later, in studying the pathology of the formation of crusts, this must be accomplished if we are to meet with success in getting rid of the obnoxious symptoms.

To meet with success in the management of a disease we must have clear ideas of its pathology.

What is the pathology of the formation of crusts and its accompanying ozena? The limits of this paper forbid anything like a full consideration of this subject, and I will advert to points just sufficient to give us a firm basis on which to found our therapeutic measures. I have already stated that the primary stage of atrophic rhinitis is one of inflammation. This inflammation is of sufficient intensity to be attended with suppuration; succeeding it we have sclerosis or atrophy of the mucous membrane. The cavernous tissue of the turbinates and the glandular tissue are all involved in this process, so that ultimately there is little left covering the bones but the connective tissue, with a few glands whose function has become perverted from the contraction to which they have been subjected.

What is the effect of this sclerotic process on the physiologic purposes of the nasal chambers? The venous channels within the cavernous bodies, whose function it is to add moisture and heat to the respired air, are destroyed, and hence the air passes through the nasal chambers poorly prepared for its ultimate purposes. The large number of mucous glands contained in this membrane are also destroyed or perverted in their secretion to such a degree as to be totally inefficient for the purpose for which they are designed.

With this knowledge of the pathology, we are able to give the most plausible explanation of the crusts and the ozena. The glandular secretion being denied, the large admixture of water which is normally present contains a large proportion of solid matter, which collects on the turbinates and undergoes decomposition or fermentation, and hence the odor.

With this view of the causation of the two essential elements of atrophic rhinitis before us we should strive to adopt measures of treatment looking to the restoration of these functions. The first step should be the entire removal of all crusts from the mucous membrane. Unless we are faithful and persistent in our efforts in this direction we cannot hope to meet with success. This is but a necessary prelude to the important step of bringing into contact with the diseased mucous surface medicaments of a stimulating nature, which will excite the perverted glands to secretion and perhaps aid in the regeneration of the mucous membrane. The method of accomplishing this object will vary with the operator; that is immaterial; the object is absolute cleanliness. The plan pursued at the Episcopal Hospital, Philadelphia, is about as follows:

The nasal chambers are sprayed thoroughly with an antiseptic detergent solution, after which all rebellious or adherent crusts are removed with a small probe, the extremity of which is wrapped with a pledget of cotton; as this process is likely to be painful, it is well to first prepare the sensitive mucous membrane by a preliminary spraying of a 4 per cent. solution of cocain. By this means also the cleansing is done more effectively. Should the crusts prove unusually tenacious in their attachment, or should a layer of muco-pus cover the turbinates, the cotton-tipped probe is dipped in a solution of hydrogen dioxid and the crusts or pus is dissolved away. This latter is succeeded by another spraying with the antiseptic fluid, to remove the dissolved and frothy mucus or pus. While this procedure will doubtless cleanse the anterior nares, there still remains a large surface uncleansed, viz.: the posterior surface of the turbinate bodies and the vault of the pharynx—the latter especially being liable to be the seat of inspissated mucus.

The post-nasal surfaces are probably better and more easily cleansed with the post-nasal syringe or by atomization. However, even in this locality the crusts are frequently so tenacious as to defy the usual methods with syringe or spray. In such cases they must be removed by means of a cotton-tipped probe bent at such an angle as to pass readily behind the soft palate and up to the vault of the pharynx. To effect this satisfactorily, and to avoid wounding the sensitive tissues of the upper pharynx and vault, and even the pharyngeal orifice of the Eustachian tube, full illumination with the aid of a rhinoscopic mirror should be employed.

I have dwelt thus on the details of cleansing, doubtless familiar to all present, to emphasize the fact that without it all subsequent treatment will be futile. Assured that our cleansing has been effective, we are ready to apply to the mucous surface our medications.

Compounds of zinc stearate have for their base zinc stearate, to which may be added any drug that the operator deems necessary for the case. They are dispensed as an amorphous powder, which has a saponaceous or oily feel when handled, and has a peculiarly strong adhesiveness to mucous surfaces. Drugs in powder-form have for many years been used in the treatment of atrophic rhinitis, but within

a few years past there has been a tendency on the part of rhinologists to discard them from their armamentarium. I think the reason for this has been the exceedingly limited time a drug in powder-form could be depended upon to adhere to the mucous surfaces, and hence the utter uncertainty as to the beneficial effect accruing therefrom. It has occurred to me that possibly whatever merit the compounds of zinc stearate possess is due to the tenacity with which they adhere to the mucous surfaces, and thereby exert an influence for a prolonged period.

The indications for treatment, as already stated, are that we shall have some drug of a stimulating nature for the purpose of exciting the perverted mucous glands to increased activity, and, if possible, aid in the regeneration of the destroyed tissue. Europhen[1] was the stimulant selected for incorporation with zinc stearate. After the cleansing process, a powder of zinc stearate, with europhen, 25 per cent., was blown into the nasal chambers with the insufflator, so that a thin layer of the powder was apparent over the middle and lower turbinates and the septum.

The observations in the use of this drug have extended over a period of a year-and-a-half at the clinic of the Episcopal Hospital, and they include fifty-four carefully selected cases, *i. e.*, those in which crusts were invariably present, and in the majority accompanied by ozena. All cases presenting simply an atrophic or rather sclerotic condition of the turbinates, unaccompanied by crusts or ozena, have been rigidly excluded, for the reason that they admitted of a doubt as to the diagnosis between the secondary sclerotic change of hypertrophic rhinitis and the disease in question. All of these cases were seen in dispensary service, a source admittedly difficult and unsatisfactory in making deductions or drawing conclusions.

As a matter of convenience and in order the better to study the results, these fifty-four cases have been divided into three classes: (1) Those that were persistent in treatment and faithful in attendance; of this class there were twelve. (2) Those that presented themselves at the clinic at irregular intervals, though seen at times over nearly the whole period of these observations, namely, eighteen months; this class numbered twenty. (3) Those that presented themselves but once or twice after the first treatment; these, numbering twenty-two, have been excluded from all deductions; therefore the observations may the more properly be said to cover thirty-two cases.

The treatment was employed twice weekly; in the interim of the visits, the patient was directed to use a hand-atomizer containing a solution of Seiler's tablets.

[1] Europhen: U. S. Dispensatory, 1894, p. 1628.

After the first cleansing and subsequent insufflation there was in all cases an entire absence of odor, and in the larger number this was persistent, no odor being perceptible upon any of the subsequent visits. It is quite evident to all rhinologists that simple cleansing is not sufficient to effect this result. In five of the most pronounced cases an odor was still perceptible at three, or at the most four, visits subsequent to the first cleansing and treatment, after which it entirely disappeared in the three that belonged to the first class; whilst in the two that fell in the second class, the odor, after the fourth or fifth visit, though still present, was markedly diminished, leaving me to infer that had the treatment been faithfully continued the result would have been the same as in the first class.

As to the crusts, in the large majority of cases no crusts formed after the first treatment; the appearance presented at the subsequent visits was that of a thin layer of muco-purulent secretion covering the turbinates, which became smaller and smaller in quantity at each subsequent visit until finally it disappeared, leaving the turbinates moist and free from the familiar dull, glazed appearance.

Whilst this was the general result, in the five cases noted as persisting in odor of an unusually rebellious nature the crusts adhered tenaciously; but even in these, after three or four insufflations, the three cases belonging to the first class showed a marked improvement. In two of the three the crusts, and finally the muco-purulent secretion, entirely disappeared, leaving the mucous membrane as already described. In the remaining one this thin muco-purulent secretion still persists, notwithstanding an amelioration of all other symptoms both subjective and objective.

In one of the two cases of the second class, or that of indifferent attendance, after an interval of nearly two months, in which time even the cleansing at home was continued in a very irregular manner, there was a reappearance of the crusts, but in no such number or of as great tenacity as when the treatment was begun; they were easily dislodged by ordinary spraying. In the remaining case of the second class, in which the cleansing at home had been carefully done, though attendance at clinic had been irregular, the crusts disappeared, though there is some muco-purulent discharge. In all the cases, after a few insufflations, the nasal mucous membrane presented an entirely different appearance, the dry, shrunken, lifeless membrane being replaced by a reddened, moist, and actively-secreting surface. In two of the cases in which the improvement was the most marked there seemed to be something like a regeneration of the turbinate tissue, though I am not prepared to admit that this is really the case; whilst there undoubtedly was an increase of tissue over

the shrunken turbinates, this has not assumed the appearance of true cavernous tissue.

To sum up: In a total of thirty-two cases of atrophic rhinitis that have been under observation, the shortest time being two months, the longest eighteen months, there were twenty-seven in which there was a complete disappearance of crusts and odor, and two of these cases promised a restoration of normal functions and structure. In five the results are very doubtful, though the improvement is sufficient to promise more for the future.

What is the rationale of this treatment? The first thorough cleansing enables us to apply a stimulating preparation for a long period of time to the mucous surfaces, thus exciting the remaining mucous glands to increased activity, throwing off larger quantities of water, which, bathing the tissues, prevents the formation of crusts and the consequent odor. It may be said that by thorough cleansing we accomplish all that is claimed for this treatment. I have never seen, even when the utmost care has been observed in cleansing both by the physician and by an intelligent patient, such thoroughly clean nasal chambers as after a few weeks' treatment of combined cleansing and application of compounds of zinc stearate. Again, while it is true that thorough and persistent cleansing removes all odor, and, in a measure, all crusts, there still remains that dry, unhealthy, glazed mucous surface; and here, to me, is the most noticeable beneficial change.

Whilst subjective symptoms play a very unimportant rôle in making up our prognosis in this disease, it has a most important bearing in the mind of the patient. The testimony of those who have pursued this treatment is the same—that it is followed by great relief of the feeling of fulness and dryness and other uncomfortable sensations about the head and throat, and that this persists nearly up to the time for the next treatment. I firmly believe that were there not some relief to the feelings of the patient we would not have had among fifty-four cases even as many as twelve to return each time, and twenty more to return at intervals.

These insufflations have been made twice a week. It has occurred to me that perhaps a more frequent, say daily, use would produce results more promptly and of more lasting character. It could easily be accomplished with intelligent patients by first instructing them as to the method of cleansing by means of the atomizer, to be followed by blowing the powder into the nostrils. The method of Ingalls,[1] of Chicago, commends itself to me to accomplish this latter maneuver.

It cannot be claimed zinc stearate is specific; indeed, it is too early to even assume that it is of real benefit; all that can be said is that the trial justifies a continuance of the plan and a further study as to the permanence of the effects. There may be other methods just as serviceable, but to me this has rendered the best service because of its simplicity of application, its effectiveness in relieving the distressing symptoms, and the comfort that it seems to induce.

CLINICAL MEMORANDA.

A LARGE ROUND-CELL SARCOMA OF THE UTERUS.

BY JOSEPH McFARLAND, M.D.,
DEMONSTRATOR OF PATHOLOGICAL HISTOLOGY AT THE UNIVERSITY OF PENNSYLVANIA, PATHOLOGIST TO THE KENSINGTON HOSPITAL FOR WOMEN.

IN the summer of 1893 I received from Dr. Charles P. Noble, Surgeon-in-Chief to the Kensington Hospital for Women, some fragments of tissue removed with a curet from a case diagnosticated as sarcoma of the uterus, with the request that I would submit them to careful microscopic study, to determine their nature and establish their malignancy. Knowing that sarcoma of the uterus is a much more rare affection than is generally conceded by gynecologists, and hoping to discover an interesting case, I imbedded, cut, and carefully examined, several of the largest fragments. Disappointment followed, for the tissues were found to be fibrous instead of cellular, and were in a state of universal myxomatous degeneration. With the exception of an occasional leukocyte, small hemorrhagic areas with well-preserved erythrocytes and a few muscle-cells, the entire structure of the tissue-constituents was destroyed. There was no clinical question of doubt as to the existence of a tumor of the uterus, but of its nature nothing could be determined from an examination of the removed masses. Satisfied that there was nothing malignant in what had been sent to me, and recognizing the condition as one quite common in sub-mucous fibroids of the uterus, I rendered my opinion that *there was no malignancy in the case, but that the patient in all probability suffered from a sub-mucous fibroid which was ulcerated and degenerated.*

This opinion made very little difference in the treatment, for, when after appropriate topical measures, the condition was found to grow worse rather than better, Dr. Noble removed the whole uterus.

When I opened the uterus by an anterior incision extending from the cervix to the fundus, a large, ragged, ulcerated tumor—unquestionably a fibroid—was found projecting from the superior posterior surface into the cavity of the organ. It was circumscribed everywhere except at its broad pedicle, which was very intimately attached to, indeed almost continuous with, the uterine wall.

[1] . . . "By means of a glass tube, about four inches in length, with a caliber of about one-eighth of an inch, which is attached to a rubber tube, through which the patient blows the powder into his nose. The glass tube is disconnected from the rubber; its round end moved about in the powder until it is filled up about one-quarter of an inch; the same end is then reintroduced into the rubber tube, and the flattened end of the glass tube introduced into the nostril. The patient then places the other end of the rubber tube between his lips and gives a quick, strong puff, which forces the powder into the naris."—*Journal of the American Medical Association*, Sept. 15, 1894, p. 424.

After careful macroscopic examination I reported that the examination of the gross specimen confirmed the microscopic diagnosis and that the specimen was one of fibroid tumor.

The later history of the case is best described in the following letter:

PHILADELPHIA, December 21, 1893.

DEAR DOCTOR MCFARLAND:

Perhaps you will recall a specimen from a case of sarcoma of the uterus which I sent you last summer. You reported to me that the patient had a myxomatous degeneration of a fibroid tumor, and that it was a perfectly benign growth.

I removed the entire uterus upon the diagnosis of sarcoma, and will herewith give you the history of the patient since the operation. She promptly recovered, and remained well until about six weeks ago, when pain developed in her right chest. Consulting her family physician, she was told that she had water in her chest. Shortly after this she was obliged to go to bed. Her respiration was profoundly embarrassed. The chest was aspirated, but only about a pint of blood-stained serum could be removed, and apparently there was no more fluid in the chest. She was very slightly relieved by the operation. At this time several small tumors, one under the skin of the breast, another under the skin of the loin, and a third under the skin of the thigh, appeared.

About two weeks ago I saw her after she had been ill for some five weeks. She was breathing eighty times per minute, and her pulse was so rapid that one could scarcely count it. There was absence of respiratory sounds from over the front of the chest, and evidence of consolidation of the lung over the back of the chest, on the right side. She refused further interference and died about a week later. No post-mortem examination could be obtained.

Kindly let me have your opinion of the case. Was it carcinoma or sarcoma? The evidences of malignancy seem clear to me, as at no time was there any rise of temperature to account for the fluid in the chest upon the supposition of an ordinary pleurisy or of a tuberculous pleurisy. The fluid cannot be accounted for either on the ground of disease of the heart or kidneys, as these viscera were healthy. The appearance of the small tumors in the fatty connective tissue under the thigh and the solid enlargement in the right chest, all point to malignancy. Truly the problems confronting the surgeon are difficult of correct solution in every case, and it is very interesting to have the pathologists with whom to compare notes. I think that after a time each will have a greater respect for the difficulties presented to the other in his work. . . . .

Very sincerely yours,

CHARLES P. NOBLE.

The unexpected course and termination of this case suggested to me that the malignant disease was situated elsewhere than in the uterus. As no autopsy was allowed, the only organ which was at hand for examination was the uterus; and though satisfied that the tumor which it contained was a fibroid, I decided to make a careful study of it. A vertical section was made through the entire tumor, a thin slice removed, and after imbedding in celloidin, large topographical sections (1 x 1½ inches in size) were cut, stained with Delafield's hematoxylon and subjected to careful microscopic study. The appearances were as follows: The edge of the section representing the surface that had projected into the cavity of the uterus was found to be denuded of epithelium, to contain no endometrial glands, but to be incrusted with a mass of coagulated blood and degenerated tissue which had been the source of the fragments first sent for examination and study. Here and there this surface-coating was interrupted by a fissure of considerable size which ascended for some distance into the tumor, and terminated in the lymph-spaces. These fissures were the separations between the tissue-bundles making up the tumor. The tumor-substance was of unstriated muscle-tissue mixed with considerable fibrous connective tissue (myofibroma), and was perfectly typical near its attachment, though inclined to be hemorrhagic and myxomatous at the exposed surface. Whether the exposure of the surface was due to the ulceration of the tumor through the endometrium, or to the damage done by the curet, was not possible of determination. As far as has been described, the tumor was an ordinary fibroid. If one began to study the lymph-spaces of this tumor at one of the fissures upon the surface, and gradually ascended into its substance, a rather remarkable series of cellular constituents became visible. As the description of the changes will follow more naturally in a description beginning above and gradually descending, I shall follow that order.

Scattered through the substance of the tumor there were occasional patches, at first sight suggesting small inflammatory areas, consisting of very uniform, small round cells, not arranged with any regularity, but extending indefinitely into the surrounding lymph-channels, only moderately infiltrating the tissue. Where the larger lymph-spaces began to enter the sinuses extending from the surface of the tumor into its substance, it could be determined that these round cells bore a definite relation to these sinuses, in some places accumulating so as to blockade them, in others forming thick marginal linings; in still other places the cells did not appear to occupy the spaces; but formed masses in their close proximity. As the lymph-spaces and channels were followed through the tumor to the sinuses upon its surface, it was evident that this cellular development was a change common to most of them, and extending over a considerable part of their length. While the small cells near the interior of the tumor were about the size of leukocytes and much like them in appearance, their size and appearance changed so that they became larger, and they occasionally presented two, three, or four, or even five nuclei, and in many instances assumed much the appearance of epithelial cells. Between the small round cells and the large multinuclear cells a great variety of transition-stages could be traced. In certain areas in which these large cells were subjected to lateral pressure the appearance of columnar epithelia was suggested. It is not possible, however, that the cells could have had such a parentage.

As the cells were carefully observed in descending from the interior to the surface of the tumor, a peculiar degeneration of the protoplasm of the cells was evident. This caused a greater bulk of protoplasm, an abnormal transparency and a viscidity which allowed the coalescence of neighboring cells and the formation of giant-cells, and even at the lowest points of protoplasmic nucleated masses such as were described by the older pathologists as "nucleated protoplasm." This degenerated protoplasm tinged well with eosin and was quite characteristic of that called *hyaline*. At the very surface of the tumor the destruction of the cells was so great that their

detritus, together with the myxomatous degenerated fibers of the tumor and the extravasations of blood, formed a common coagulation-necrotic mass.

The examination of the cervix and walls of the uterus showed no important changes. Many of the cellular extensions passed from the tumor into the fundus of the uterus, but high up the changes were inconspicuous and the number of cells small.

The peculiarities of the case were marked. The inference, which seems justifiable from the careful research to which the specimens were subjected, seems to point to a primary change in the lymph-channels with the hyperplasia of the endothelia and connective-tissue cells associated with them, and the production of a tumor at least similar to that variety of sarcoma called *endothelioma*. Added to this there were degeneration and the production of monstrous cells. The gaping sinuses and large lymph-spaces connected with them suggest the easy passage of these cells through the lymph-circulation of the uterus, their entrance into the general circulation and the consequent production of the metastatic tumors which caused the death of the patient.

It should also be observed that the amount of sarcomatous tissue in the tumor was small, so that the metastasis originated in all probability from what would have been regarded as an almost insignificant lesion had not such disastrous consequences followed its development. The case also illustrated the changes, so little understood, by which a perfectly benign tumor may change to a malignant one.

DYSPNEA AFTER EXCISION OF THE TONSILS.

BY GEORGE WALKER, M.D.,
OF YORKVILLE, S. C.

EXCISION of the tonsils when properly performed is generally considered an easy operation and devoid of danger. I have lately had a case that deviated somewhat from the general rule.

The patient was a stout, well-developed female, twenty-two years of age, who had every appearance of being in perfect health. She was only slightly nervous at the beginning of the operation.

The tonsils were considerably enlarged from repeated inflammations. The throat was sprayed with a 4 per cent. solution of cocain. The left tonsil was then excised by a good tonsillotome; the operation was easily performed, and with very little pain. In a few minutes the patient said she felt sick and very faint, but these symptoms passed off in a little while. The other tonsil was then cut away in the same manner without difficulty, and without much pain. The whole of both tonsils was taken out. The woman again complained of faintness and sickness, but there was no vomiting. As these symptoms did not pass off as before, she arose, walked to the bed, and lay down. Shortly after this I noticed that her respirations were difficult, and she said that she was choking. On close examination the trouble seemed to be due to spasm of the respiratory muscles; her arms and hands began to cramp, the fingers assuming a claw-shape. The breathing became still more difficult. She rolled from side to side on the bed, her hands clutching her throat; she gasped for breath, and said in a husky voice, "I am choking—I am choking to death!" The face was very red, the pulse somewhat quickened, but regular and strong.

The symptoms increased in gravity; the respiration got still more difficult, shallow, and jerky, and finally ceased entirely. The head was lowered and artificial breathing was begun. In a short time the respiration came back, but it was of the same hard, difficult nature; it continued thus for about forty minutes, and in spite of all efforts ceased again; it was an entire stop, and I was certain that she was dead. We again commenced artificial respiration vigorously, and after prolonged efforts she gave a jerky breath; I stopped a moment and told her to breathe. She did so, then ceased. I told her again, and she did so. By continuing the artificial respiration and telling her in a loud voice to breathe, breathing was finally established, though still somewhat hard. It gradually got easier, and remained so. She came to herself, asking her whereabouts and what had happened, seeming to have no recollection of anything except her throat being sprayed the first time. I think the trouble was caused either by irritation of the respiratory nerves or by toxic action of cocain, most probably the latter. As stated, only a 4 per cent. solution was applied by means of an atomizer. None was injected, and the woman was directed to swallow none. I have knowledge of a case occurring in the practice of a medical friend in which similar symptoms were produced by hypodermics of a 10 per cent. solution of cocain preparatory to the removal of a lipoma.

MEDICAL PROGRESS.

Sub-diaphragmatic Abscess Communicating with the Right Pleura Successfully Treated by Costal Resection and Drainage.—At a recent meeting of the Clinical Society of London, MACKENZIE and ABBOTT (*Medical Press and Circular*, No. 2895, p. 453) reported the case of a boy who came under observation in the fourth week of an illness of sudden onset and characterized by severe pain in the epigastrium and right hypochondrium, together with vomiting. A week after the onset a swelling was noticed in the epigastrium. The right side of the chest yielded the physical signs of a pyo-pneumothorax. The swelling in the epigastrium became more prominent when the patient sat up or coughed, and gave distinct evidence of fluctuation. It was concluded that there existed a sub-diaphragmatic abscess communicating with the right pleural cavity, and it was decided to drain both by an opening in the pleura. Accordingly the sixth rib was resected just behind the mid-axillary line, and thirty ounces of exceedingly offensive, thin, watery pus, containing some flakes, were evacuated. On exploration with the finger the upper surface of the liver was felt through an opening in the forepart of the diaphragm. The whole cavity was well irrigated with a warm boric-acid solution, and a double drainage-tube was inserted. The cavity was irrigated daily, but the discharge continued to be offensive for several days. On the thirty-fifth day after the operation the wound was almost healed and there was no discharge. The patient was dismissed on the forty-seventh day. The lung expanded well, and the only sign to be detected six months later was a slight relative dulness at the base of the right side of the chest. The presence of air as well

as fluid, together with the fetor of the abscess, pointed to the perforation of an air-containing viscus, most probably as a result of gastric or duodenal ulceration.

Femoral Epiplocele in a Woman; Radical Operation.—At a recent meeting of the Section on Surgery of the Philadelphia College of Physicians, Dr. W. J. TAYLOR reported the case of a woman, forty-six years old, who for twelve years had a lump in the right groin which gave no trouble until about four or five months before coming under observation, when it enlarged and became very painful. She was in the country at the time, and went to bed and applied poultices to the swelling. In a few days she was much improved, the pain and swelling relieved, but the mass did not disappear entirely. There was a good deal of swelling above Poupart's ligament and in the inguinal canal on the right side. There was some doubt as to whether it was a new growth or a hernia. With rest in bed and care the amount of inflammatory thickening was very much reduced. An incision over the tumor, exposed a very hard tense sac, which was easily dissected away, and an omental hernia was found just above the internal inguinal ring. The sac was then opened and the omentum drawn out until a healthy portion was reached, around which a ligature was passed and the mass removed. The sac was dissected free from adhesions and ligated with silk. The whole mass showed evidence of long-standing inflammation. On closing the abdominal ring the mass was discovered to be a femoral hernia. The edges of the canal were approximated with two sutures, without injury to the artery; during the operation only one small vessel required ligation.

Perforation of a Typhoid Ulcer in a Young Child.—SCHOFIELD (*British Medical Journal*, No. 1763, p. 809) has reported the case of a boy one-and-three-quarters years old who presented failure of appetite, with vomiting, loss of flesh, abdominal distention, considerable diarrhea, and slight cough. These symptoms gradually increased in severity and led to a fatal issue. Upon post-mortem examination a few flakes of lymph were found between the coils of the intestine and about the liver and spleen. One of the lower coils of the small intestine was adherent to the front of the cecum, and between the two was a small cavity whose walls were completed by lymph. This cavity contained some fecal matter, and on further examination was found to open into the ileum about ten inches from its lower end, by a clean-cut perforation one-third of an inch in diameter, in a Peyer's patch. In the same patch was seen another small ulcer, and below this there were a dozen similar ulcers extending as low as the cecum, in which two ulcers were found. All of the ulcers were more or less circular, with sharp edges and smooth floors. There was no noticeable enlargement of the mesenteric glands. The spleen was soft and slightly enlarged.

Neuritis Simulating Progressive Muscular Atrophy, Associated with Nystagmus and Increase of Knee-jerks.—MOYER (*Journal of the American Medical Association*, vol. xxiii, 1894, No. 17, p. 647) has reported the case of a woman twenty-one years old who complained of progressive loss of strength and wasting of the hands and arms, of four years' duration, without previous injury or serious illness. At first there was much pain in the hands, which would dart up the forearm, together with numbness and tingling, but subsequently sensation became impaired. The hands were held in a claw-like, semi-flexed position, but there was no contraction of the flexor tendons. Fibrillar tremors were occasionally to be seen in the wasted muscles, which manifested the reaction of degeneration. Nystagmus was present, but the eye-grounds displayed no lesion. The patellar tendon-reflex was exaggerated on both sides, with prolonged ankle-clonus. The girl, who was a servant, was compelled to have her hands in cold water a good deal, and the wasting and weakness, as well as the sensory changes, were ascribed to a peripheral neuritis dependent upon this exposure. The nystagmus and exaggerated reflexes were attributed to associated disseminated sclerosis.

Myxedema Due to Actinomycosis.—KÖHLER (*Berliner klinische Wochenschr.*, No. 41, p. 27) has reported a case of myxedema in a woman forty-eight years old, who for eight months presented a swelling of the anterior aspect of the throat, at the outset attended with redness. It was stated that the swelling had been treated with poultices, in the sequence of which a discharge of blood and pus took place. Several surgical operations had been performed, but a slight suppurative discharge persisted. The ulcerated surface was curetted and the case appeared to progress favorably, but subsequently incision became necessary, and resulted in the evacuation of pus containing granulations characteristic of actinomycosis, and which upon microscopic examination disclosed the presence of this fungus. A free excision was made, exposing the partially destroyed thyroid gland. The wound was thoroughly curetted, and finally treated with the thermo-cautery. Granulations soon formed, and closure of the wound was expedited by skin-grafting. With the improvement in the local condition the symptoms of myxedema likewise receded. The portal of infection could not be learned. Reference is made to another case in which symptoms of myxedema were dissipated by anti-syphilitic treatment.

Myxedema in Children.—NORTHRUP (*Archives of Pediatrics*, vol. ii, No. 11, p. 793) has reported two cases of myxedema in children, one in a girl nine years old, and the other in a boy twelve years old. In the first the symptoms appeared at the age of nine months, and from this period the child had scarcely developed, not only mentally but physically as well. Both were treated with a glycerin extract of sheep's thyroid, of which one dram represented one gland from a young animal. One minim of this was administered three times a day, the dose being increased one minim every second day until the temperature rose, the attempt being made to keep the temperature at a point just below 100°. In the first case the treatment was continued for eighty days, and was attended with diminution in the size of the tongue, improved expression of the countenance, ability to take more and varied food, and the acquisition of two teeth. In the second case the treatment was pursued for seventy-six days, and the improvement was more noteworthy.

THERAPEUTIC NOTES.

The Treatment of Diphtheria with the Antitoxin.—KÖRTE (*Berliner klinische Wochenschrift*, 1894, 46, p. 1039) reports the results obtained in the treatment of 121 cases of diphtheria with the antitoxin. He divided the cases into three groups: (*a*) severe cases; (*b*) cases of moderate severity; (*c*) mild cases. Of the whole number recovery ensued in 81 (66.9 per cent.), and death in 40 (33.1 per cent.); while from June, 1890, to December 31, 1893, among 1160 cases of diphtheria the proportion of recoveries was 54.9 per cent., and that of deaths 45.1 per cent. In the intervals between the periods of treatment with the antitoxin, at a time when none of the remedy was to be had, among 106 cases there occurred 49 recoveries (46.2 per cent.), and 57 deaths (53.8 per cent.) Considering 121 cases treated with antitoxin according to their severity, there occurred among (*a*) 43 severe cases, 41.8 per cent. of recoveries and 58.2 per cent. of deaths; among (*b*) 47 cases of moderate severity, 70. 2 per cent. of recoveries, and 29.8 per cent. of deaths; and among (*c*) 31 mild cases, 96.7 per cent. of recoveries and 3.3 per cent. of deaths. Fifteen of the cases occurred in children under 2 years of age, with 8 recoveries and 7 deaths. Tracheotomy became necessary in 42 cases on account of threatening dyspnea; of this number 20 (47.6 per cent.) recovered, and 22 (52.4 per cent.) died, as compared with 22.5 per cent. of recoveries, and 77.5 per cent. of deaths in previous years. Of 108 children under 2 years of age in whom tracheotomy became necessary between June, 1890, and March 31, 1893, 10 (9.2 per cent.) recovered; while of 8 within the same age-limits treated with the antitoxin, 3 (57.5 per cent.) recovered. Fourteen severe cases came under treatment within the first three days of the disease. Of these 11 recovered, while 3 died. In 29 others the treatment could not be instituted earlier than on the fourth day. Of these but 7 recovered, while 22 died. Twenty-three cases of moderate severity came under treatment within the first three days of the attack. Of these 18 recovered and 5 died. Twenty-two others did not come under observation until after the fourth day. Of these 14 recovered and 8 died. In the one mild case that terminated fatally diphtheria-bacilli were not found in the exudate. It appeared that in some cases general intoxication took place so rapidly as to render useless the employment of the antitoxin when the cases came under observation. It also appeared as if the results were better when the initial small dose (200 immunity-units) was increased. In the fatal cases death was due to causes over which antitoxin was capable of exerting no influence. Nephritis was the most common complication. It was not observed that the treatment had any influence upon the temperature or upon the local condition, although the injections were soon followed by distinct improvement in the general condition.

Secondary Effects of the Antitoxin of Diphtheria.—LUBLINSKI (*Deutsche medicinische Wochenschrift*, 1894, No. 45, p. 857) has reported a case of nasal and pharyngeal diphtheria, in a girl eight years old, in which treatment with the antitoxin was followed by the development of erythema exsudativum multiforme. Ten c.c. of Behring's serum (representing 600 immunity-units) were injected on the third day of the attack, and again twice on the fourth day. The local and general conditions underwent decided improvement, although sensitive areas of redness formed at the sites of injection. On the thirteenth day both ankle-joints became reddened and swollen, and in the course of the night a small, measly-like eruption appeared, extending in the course of the following day upon the extensor surfaces of both lower extremities, and subsequently appearing upon the extensor surfaces of the upper extremities. There were also pains in the knee-joints, elbow-joints, and ankle-joints. For several days matters continued thus, the exanthem extending and the pains persisting, but finally both began to subside, and at the end of a week the child was quite well.

Thyroid Gland for Exophthalmic Goiter.—At a recent meeting of the Société Médicale des Hôpitaux, VOISIN (*Gazette Médicale de Paris*, 1894, No. 43, p. 513) reported the case of a woman, thirty-two years old, affected with exophthalmic goiter, to whom he administered twice daily, before meals, from one-and-a half to two drams of thyroid gland from the sheep. After two weeks of this treatment the patient was materially improved. The heart-beat was more regular, and had fallen from 150 to 100 in a minute. The edema of the lower extremities had disappeared, while the thyroid was diminished in size and the exophthalmos had receded. The treatment was thus continued with advantge, being suspended for ten or twelve days every three weeks.

The Treatment of Goiter with Thyroid Gland.—BRUNS (*Deutsche medicin. Wochenschr.*, 1894, No. 41, p. 785) has reported twelve cases of goiter treated by means of the administration of thyroid gland, cases of the parenchymatous variety being selected. Of this number nine were cured or improved, while three proved refractory. Fresh uncooked glands obtained from sheep and cows were employed, and administered in doses of from 75 to 150 grains in cachets or upon buttered bread, at first every two or three days, but subsequently once a week.

For Hemoptysis.—

℞.—Ergotini	. . . . .	gr. xx.
Acidi gallici	. . . . .	gr. xl.
Syrupi tolutani	. . . . .	f℥iv.
Aquæ	. . . . . ad	f℥iv.

Misce et fiat mistura.

S.—One teaspoonful to be given every two or three hours. *The Practitioner.*

Thyroid Extract in Insanity, with Goiter.—MCCLAUGHRY (*Journal of Mental Science*, October, 1894, p. 635) has reported two cases of insanity associated with goiter, in which thyroid extract was administered with highly encouraging results. Five grains were given at each meal in the form of tabloids.

In the Treatment of Dry Pleurisy, CÉRENVILLE (*Semaine Médicale*, No. 60, 1894, p. 477) recommends intra-pleural injections of sterilized olive-oil, in the sequence of which the pleural friction and pain soon disappear and the remaining symptoms speedily subside.

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SATURDAY, DECEMBER 8, 1894.

THE NERVOUS SYMPTOMS OF CIRRHOSIS OF THE LIVER.

ONE of the oldest chapters in medical science is that which is devoted to the psychology of the liver. "Melancholia," the *black bile*, is the enduring symbol of visceral insanity; it is one of those monumental terms that sum up the history of a science at the same time that they embody an error. It stands for a disease that never had an existence, but which has handed down to present times its ancient terminology, and fastened its name upon one of the most common affections in modern life.

The ghost of this ancient pathology still lingers in our modern text-books. Even now it will not down. A wide domain is preserved for it: the fertile field of the so-called "sympathetic" insanities. VAN HELMONT, we are told, revived the ancient opinions respecting the sympathetic action of diseased viscera upon one another, and especially upon the brain. With him began the era of "visceral irradiation;" he made a sort of recension of that fable of ÆSOP, in which the belly was at war with the members.

The symmetric outlines of this pathology were perfect; all proper analogies were observed in it, as is always the case in good dialectics. Thus, if the peccant viscus was inflamed, the consequent mania by metastasis had all the violence of the inflammatory diathesis; and, on the other hand, if the organs suffered the invasion of some mephitic humor, the consequent psychosis was as black as night. But the blackest of them all was from the liver; *similia ex similibus fiunt.*

There is no organ, says an old authority, with the morbid actions of which the functions of the brain so frequently sympathize as with the liver; and, still more significant, he says, that diseases of the hepatic system will even originate delirium and furious mania, as well as the classic melancholia and suicide. TODD, CHEYNE, and BURROUGHS, all claimed many years ago that they had even found in the liver traces of the morbid anatomy of insanity. Latest of all, RÉGIS, whose work has just been translated, devotes a whole section to "hepatic insanity," and thus completes the ever-revolving cycle of pathology. This brings us to our text.

We maintain that organic disease of the liver is sometimes the cause of grave mental changes; not in the sense of the ancient sympathetic doctrine, although there is some truth in that, too. That doctrine can rest at least upon a broad foundation of gall-stones. We are far from assailing it; in fact, from our own clinical data, we might add a stone or two to its tumulus. We speak in an entirely different sense. We refer to the liver as an *infective* agent in mental disease. We are about to deal here with a form of toxic insanity. And yet, let us note, in passing, our own tendency to revert to ancient methods; what we have seen and what we write here lead us once more to the humoral pathology. By a benign, not vicious, cycle we are led to bear tribute from out of the fulness of our modern science, and lay it at the foot of the altar where worshipped some old Asclepiad. How often is this so!

In cirrhosis of the liver there is observed sometimes a mental affection which is both conspicuous and significant. It is a true toxic delirium, that is to say, it shows the peculiar mental phenomena that characterize, almost without exception, the deliria caused by poisoning of brain-tissue. So characteristic are these phenomena that the etiologic factor, *i. e.*, some form of blood-intoxicant, can, we had almost said, be predicated of this class as an essential prerequisite. The mental affection is one of confusion with hallucination. It is a

delirium, in the ordinary English acceptation of that term; not a mania or a melancholia. It is almost identical in form with the delirium, or confusional insanity, that follows prolonged fevers, or the puerperium; or that sometimes explodes as a delirium *grave;* or is seen in the more familiar delirium tremens, minus the tremor. The Germans have the term *Wahnsinn*, which connotes this state.

This *Wahnsinn*, or confusional insanity, whether seen in conjunction with cirrhosis of the liver or any other state, is not, properly speaking, a pure psychosis any more than is the delirium of typhoid fever. It is primarily an affair of the liver when it occurs in cirrhosis, and only secondarily a state of the brain. Purge the obnoxious liver of its humors, and the brain will not be ill. In this sense TUKE, in a recent brochure, emphasizes the fact that the psycho-neuroses are diseases of the body rather than of the "mind." Hence this most instructive, but rather rare, confusional delirium in cirrhosis is an object-lesson of great worth. We see in it, as it were, the brain poisoned, the mind overwhelmed by the infectious materials of the body's own making. We are at the threshold of modern pathology. We are face to face with auto-infection.

It is a curious fact that little note is taken in the text-books of this most important rôle of cirrhosis of the liver. The cause, probably, is the fact that this delirium is rather rare, except toward the very end of the disease. FRERICHS, however, in his great monograph, distinctly notes this complication. He says that delirium occurs in rare cases in cirrhosis, and seems to think that it is due to acholia, as in acute atrophy of the liver. He mentions in the same clause convulsions and coma (seen also in uremia and acetonemia), and seems to imply that the duration of all these crises is brief.

That this latter inference is erroneous, however, our own clinical experience has amply demonstrated. We have seen, in a recent case, a wandering delirium, of mild grade, with hallucinations, and confusion of the identity of persons and places, without convulsions or coma, and, with fair digestion and nutrition, extend over a period of four months, without intermission. During this period there was neither albuminuria nor glycosuria. The ascitic fluid was withdrawn, and reaccumulated four times. Epistaxis was copious at times, but there was neither gastric nor intestinal hemorrhage. The autopsy revealed a hob-nailed liver, extraordinarily hard and contracted.

We may note, finally, that in this solitary case an expert analysis of the urine, secured in the hope that it would give evidence of toxemia, revealed nothing but a doubtful trace of acetone. Thus we return to the point whence we started, for we seem to have advanced only by a trace of acetone beyond the humoral pathology and the hepatic psychiatry of the ancients.

THE INJUSTICE OF COMPETITIVE CHARITY.

HAS the medical staff nothing to say as to unlimited endowing of free beds in enterprising hospitals, and the free treatment of anybody and everybody, upon payment of nothing, or of some hypocritically small fee? Is this simply and solely a matter within the control of lay-boards of trustees and of professional philanthropists? These questions are suggested by a widely-distributed circular issued by a large hospital in a city of the eastern United States, which reads as follows:

The Board of Trustees of the —— Hospital of the City of —— strongly recommend the following advantages offered to the public.

Mill and factory owners, lodges, and beneficial associations can secure a bed at the —— Hospital for 365 days by paying $200, and upon averaging the days may have several patients in the hospital at the same time.

Subscription books can be obtained by working people of both sexes up to the age of fifty, subject to the regulations of the hospital, whereby, on paying an initiation fee of one dollar and monthly installments of fifty cents, each subscriber may be treated in case of sickness entirely free of further charge. Heads of families and owners of factories should particularly recommend to their servants and employés to avail themselves of this excellent facility.

Of course, if the medical officers of this hospital have assented to this plan, nothing more in criticism can be said except to ask them:

1. Have you any right to assent to it for *other* physicians who in the course of human events may take your places by and by?

2. If all hospital staffs assent to it, have the non-hospital physicians no criticism to offer and no rights to be upheld?

3. Has the medical profession nothing to suggest as to the encouragement of pauperism and the just claim of members of the profession to some compensation for medical services from those able to pay? Has the public no duties to the medical pro-

fession in this debauching competition in "offering advantages to the public?"

4. By what principle of common justice and decency can it be claimed that well-to do "workmen, lodges, and beneficial associations" are unable to pay medical men something for their services, and that the professionally benevolent should dispose of medical service by virtue of being trustees of hospitals?

In England the impudence of these trustees and dictators of medical men has become a public calamity, and the same trend is more than evident here. Have medical societies and associations, colleges and academies of physicians, no word to utter as to the huge and growing abuse? Instead of permitting or encouraging, they should warn the endowers, supporters, and trustees of hospitals, and the easily deceived public, that the blind sentimentalism of charity almost inevitably ends in wrong and ruin, and that whatever injures the medical profession in the long run injures the health and well-being of the general public.

Not a dollar should be given to any hospital that is not accompanied by an express stipulation on the part of the giver, and by a promise as explicit on the part of trustees and officers, that no person (except in emergency cases, etc.), shall receive medical aid in the institution except it have been systematically and clearly made evident that such person is unable to pay anything for the service. Medical men are already overburdened with necessary or inevitable charity-work in private, hospital, and dispensary practice, but they display a criminal negligence as regards the increase of this evil of charity-abuse, and either supinely submit to the dictatorship of mechanic routine or of trustees, and even go so far as enthusiasm in professional hari-kari. It is high time the brakes were applied.

EDITORIAL COMMENTS.

The Health of the Army.—From the report of the Surgeon-General we learn that the health of the United States Army during the fiscal year ended June 30th differed but little from that shown by the best of army medical records. The admission-rate per thousand of strength present was 1289.04, as compared with 1270.42 for the previous year, a great improvement on the average annual rate of the previous decade (1424.20) and slightly greater than the lowest rate (1247 in 1887) ever furnished by the United States troops. The number of sick daily was 40.15 per thousand of strength, as compared with 39.60 during the preceding year. The number of days lost by sickness equaled 14.7 for each member of the strength of the army, as compared with 14.5 days during the preceding year, and with 15.8 days for the average annual number of the previous decade. The rate of discharge for disability reached its lowest point, 14 93 per thousand of strength, as contrasted with 18.35 during the preceding year and with 28.82 during the years of the previous decade. This result is ascribed to the greater care taken in the selection of men for enlistment. The deaths from all causes equaled 6.91 per thousand living, as compared with 6.44 for the previous year and with 8.51 for the years of the previous decade. Accidents and injuries accounted for 2.90 of the death-rate.

Injuries, as usual, played the most important part in the causation of the admissions to sick report, being the responsible factor in 243.29 of the 1289.04 admissions per thousand of strength during the year. Specific febrile diseases take second place, with a rate of 171.19, mostly due to influenza; diseases of the respiratory and the digestive system take third and fourth place, respectively, with 141.06 and 113.77 cases per thousand men; diarrheal diseases stand fifth, with a rate of 98.47, and malarial affections sixth, with 93.64.

Injuries were responsible also for 7.92 of the 40.15 constantly disabled in every thousand men. Venereal diseases, as in former years, take second place as a disabling cause, having kept 5.41 men unfit for duty among every thousand. Third place was taken by specific febrile diseases, 4.50, the chief factors being influenza and typhoid fever, from the number and duration, respectively, of their cases. Then follow in order of prominence diseases of the respiratory system, 3.45; malarial diseases, 2.45; diseases of the digestive system, 2.09, and of the locomotor system, 2.02, the last mostly cases of muscular rheumatism,

The absolute number of discharges for disability was 413. Seventy-one of these were occasioned by accidents and injuries, including 21 cases of hernia, 53 by venereal diseases; 48 by insanity, epilepsy, and other affections of the nervous system; 44 by pulmonary tuberculosis; 36 by diseases of the locomotor system; 32 by heart-disease, and 24 by affections of the eyes.

The absolute number of deaths was 191. Eighty of these were due to violence or accident, including 25 from gunshot wounds, and 21 by drowning. Pneumonia caused 18; pulmonary tuberculosis, 17; typhoid fever, 16; kidney-disease, 11; alcoholism, 10; heart-disease, 6, and erysipelas 5.

The mean strength of the army during the year was, according to the medical reports, 25,287 men: White, 22,429; negroes, 2,143, and Indians, 715. Both the admission-rate and the rate of non-efficiency of the white troops were larger than the corresponding rates of other races, but the death-rate of the negroes and the death-rate and discharge-rate of the Indians were considerably higher than those of the white troops.

The Indians appear to have suffered more than the whites from mumps, erysipelas, venereal diseases, conjunctivitis, and other diseases of the eye, tuberculosis, pneumonia, and glandular swellings; less than the whites from muscular rheumatism and hernia. The negroes suffered more than the whites from mumps, erysipelas, muscular rheumatism, and frostbite; less than the whites from venereal diseases. The whites suffered more than the other races from malarial and diarrheal diseases

and alcoholism. The high death-rate of the Indian was due to tuberculosis and pneumonia, and his high rate of discharge to the effects of these diseases and of syphilis.

Every Physician to Have His Own Medical Journal.—Our readers will remember our long-time interest in the increase of the number of American medical journals. It has sometimes seemed that the only logical outcome of the present tendency is that every physician, in order to keep abreast of the times, should edit and own a distinct journal of his own. This opera-bouffe crazy-thought, however, has been more than suggested; it is proposed as a business enterprise in downright seriousness and literalness. Can any reader imagine how it is to be done?

The "hustler" who proposes the plan bases his scheme upon what he considers an axiom, viz.: that the present editors of all thriving medical journals are "to-day winning financial success, etc., aided by the journals which they own, edit, etc." Then follows a long list of these remarkable editors—like sample bricks of the Irishman's house—in proof of the astonishing and ingenious discovery.

We have before us a long type-written private letter from "the ——— Medical Journal Company," setting forth the method to a correspondent, whereby the correspondent may secure such a journal for his own private use and behoof, and how the said, the ——— Medical Journal Company, can conform itself to the plan, the entire modus operandi, etc. It will be recognized as an adaptation of the old newspaper dodge of "patent outsides." We can only quote a part of this truly exquisite bit of impudence. In the slang of the day, and in a double sense, "Here's richness," indeed!

First, we will get out a journal in every way as good as the one you have in hand each month, in size, quality, etc. We will allow you one page to be filled with your own items of interest relating to your own doings, those of your patients, friends, and institution, or whatever you may choose. We will carefully eliminate the word ——— from the journal. Instead of it being called the ——— *Medical Journal*, as now, you may give it any name you choose, as the *Grand View Sanitarian*, or *The Lewiston Medical Reporter*, or whatever seems appropriate to you for your location and institution. In the space now used for our motto, "A magazine for the doctor and his family," we will print your name as local editor, publisher, or whatever you wish.

We shall be glad to have at any time short articles of practical value and general interest from yourself or colleagues for publication in the body of the journal, which we will insert as we find opportunity.

In return it is hoped you will take at least one hundred copies of the journal each month at $6 a hundred, additional copies to be furnished you at the rate of 5 cents each. In no case can less than 100 copies be sent. The pay in each instance must accompany the order, and also copy for your local news page, and be received at the home office by the 15th of each month. The price we have made you is cost. (No publishing house in the country could get you up exclusively 100 such journals as ours for less than $225.) We are able to make this price to you only on account of the great number we issue. Our pay comes through our advertising columns, which are valuable and appreciated.

The gain to be derived by you taking hold of this enterprise is great, we believe, beyond all proportion of the cost. In the first place, it binds you to nothing. You are at liberty to stop whenever you choose. You may secure subscribers to your journal in your own town and county. It will be worth more than the regular price and make it pay for itself in dollars and cents. You can send other copies to desirable parties with your compliments and attention which will win and hold their regard. Other copies left with your druggist for judicious distribution will be like bread cast upon the waters. But undoubtedly the greatest benefit of all will be the prestige that your connection with such a journal will give you and your institution wherever it goes.

In short, there is no end to the usefulness to which doctors may and do put their journals. Please give this matter the careful attention its importance merits.

Very truly yours,

THE ——— MEDICAL JOURNAL CO.,

——— *Manager.*

P. S.—In case you do not care to furnish copy for local page at any time, a notice with cut of your institution can occupy the space very effectively.

The Index Medicus, as we accidentally learn, is about to be discontinued. To publish it without a loss would require about 800 paying subscribers, and the work has been carried on, of course at a heavy loss to the publisher, with less than 300.

The disappearance of this highly valuable publication would be a great misfortune, as everyone will admit who knows or cares anything about the literary aspect of medicine. What few recognize, however, is that it would be a misfortune not to the literary physician alone, but every practising physician would directly or indirectly find himself the worse off, and his patients likewise. In placing at the command of the therapeutist the digested and classified index of all chronicled medical labor, every future patient in one way or another must feel the good and be helped by so much. We cannot practice medicine to the best advantage without in some way or other knowing what our fellows have done and are doing in the same fields of labor.

Now this periodical must not be discontinued! We have a suggestion to offer: In an accurate sense the *Index Medicus* is truly the continuation of the great *Index-Catalogue of the Surgeon-General's Library*, so indispensible to the American medical profession, and such an honor to it and to its authors. Why should not the publication of the *Index Medicus* be continued by the United States Government? If the august legislators will save the money wasted every year on pocket-books and pen-knives for their pages it would probably be amply sufficient to publish the *Index*. At all events, the work is distinctly for the public benefit and use, and the expense of its publication should be borne by the public. Why should it not appear as a part of the work of the office of the Surgeon-General? The library belongs to that department, and its publication of the *Index Medicus* would be both proper and right.

Why will not the College of Physicians of Philadelphia, the Academy of Medicine of New York, and any or all other medical societies pass resolutions or take steps to insure the continued publication of the *Index*.

Mistakes in the Execution of Food-Adulteration Laws.—Those who are responsible for the desirable prosecution of offenders against the laws as to the adulteration of foods should be extremely cautious not to make mis-

takes in selecting the articles against which to proceed. Against proprietary preparations, as such, owned or manufactured by non-medical men, there can be no criticism; indeed, medicine is indebted to non-medical chemists and honorable manufacturers for many preparations that have been of great service in therapeutics. It would be a pity if the justifiable intolerance of the nostrum-traffic should proceed to such lengths as to include useful non-secret preparations made by respectable manufacturers. To make a mistake in choosing articles against which to proceed (as, for example, the Ohio Pure Food Commission did in the case of "Vin Mariani," etc.), weakens the power of the prosecutors and creates a prejudice against their judgment. There are plenty of certainly and really adulterated articles, there are plenty of secret preparations and nostrums against which action can be taken with benefit to public health.

The Oyster as a Medium of Transmitting Typhoid Fever.—If current reports can be relied upon, an epidemic of typhoid fever among the students of a New England university has been traced to the ingestion of raw oysters taken from an infected stream. All of the victims had partaken of raw oysters supplied by an oysterman who was in the habit, after taking the oysters from the deep waters, of placing them for some twenty-four hours in the shallows of a river passing near his house. On investigation it was learned that the oysterman's wife had died of typhoid fever at about the time of the epidemic among the students, and that a daughter was also ill with the disease. The drain of the house emptied into the river at a point near where the oysters were placed temporarily. In addition to the students, a number of visitors were also attacked. If the statements cited can be verified, they will have a good deal of significance, and will exert a profound influence on an important industry. On the other hand, it is but right that they should be corrected if they prove false.

The Library of the Office of the Surgeon-General of the United States Army.—During the fiscal year ended June 30, 1894, there were added to the Library of the Surgeon-General's office 1082 medical journals, 214 volumes of *Transactions*, 346 bound pamphlets, 2272 medical books of other kinds, 2258 medical theses and 9053 medical pamphlets. At the close of the year the library was in possession of 33,297 medical journals, 4913 volumes of *Transactions*, 1663 bound theses, 2604 bound pamphlets, 72,090 medical books of other kinds, 52,218 medical theses, and 127,560 pamphlets, a grand total of 183,778. The profession is justly proud of this great library, and will resent any attempt to lessen its usefulness by curtailing its appropriation on the assumed ground of economy. The Librarian, Dr. John S. Billings, and his assistants deserve great credit for their conduct of the library.

The Army Medical Museum at Washington, on June 30th, contained 10,656 specimens in its pathologic section, in its anatomic section 3569, in the section of comparative anatomy 1717, in the microscopic section 12,033, in the miscellaneous section 1894, in the provisional pathologic section 1893, and in the provisional anatomic section 807, a total of 32,269. During the year the Museum was visited by 50,675 persons.

SELECTION.

THE BACTERIO-PATHOLOGY OF THE HUMAN MOUTH AND ITS SIGNIFICANCE IN RELATION TO SYSTEMIC DISEASES.[1]

BY PROFESSOR W. D. MILLER,
OF THE UNIVERSITY OF BERLIN.

I HAVE occupied myself now some fifteen years with the study of the microörganisms of the human mouth, with particular reference to the disturbances that they produce in the mouth and neighboring parts, as well as to their relation to diseases of the more remote parts of the body.

The results of my investigations have been made known from time to time through various publications, and are no doubt familiar to many of the practitioners and students of dentistry here present. I am convinced, however, that this is a subject of quite as much importance to the medical practitioner as it is to the dentist, and I am glad of the opportunity to present a few facts relating to it before an audience composed chiefly of practitioners of medicine, although in the short time at my disposal I shall not be able to present more than a mere outline.

The knowledge that human saliva often contains something which exerts a toxic effect upon the animal as well as the human body is by no means of recent origin.

Many of the ancient writers call attention to this fact, among others the celebrated Galen, who himself was an eye-witness to the operation of killing a scorpion by the action of human saliva, "without the aid of magic." And, further, Aristotle was acquainted with a girl whose bite was as poisonous as that of the most venomous snake. An arrow dipped in her saliva invariably killed any animal that was wounded by it. We can readily understand this now, as we know that the bite of a human being is a very serious matter, and I, personally, would prefer at any time to be bitten by a dog (unless it was suffering from hydrophobia) rather than by a human being. Even the scratch of an instrument infected by usage in an unclean mouth has been known to be fatal, and the case reported by Aristotle can be believed most readily.

Pliny relates, also, that the human saliva is poisonous, and that a snake will flee from human saliva as from boiling water, and that saliva dropped into the mouth of a snake will kill it. In all these years since Pliny no one has taken the trouble to test the accuracy of the statement, although it would be a comparatively simple matter to do so.

In recent times (1834), Eberle refers to the fact that the human saliva contains poisonous elements, and, according to his ideas, its toxic properties depend on the state of the mind at the time being. He found his own saliva to be more poisonous when he was enraged or suffering pain than at other times. He would subject himself to irritating influences in order to become enraged artificially, and noticed that the toxic action was

[1] Read before the Wistar Biological Association of Philadelphia, October 2, 1894.

From advance-sheets kindly furnished by the Dental Cosmos.

increased thereby. Later on many observations were reported, all tending to definitely establish the fact that when smaller animals, as rabbits and mice, are vaccinated with saliva, they almost invariably die within twenty-four or thirty-six hours.

It was believed for a time that the toxic agent was potassium sulphocyanid. However, it was shown by others that the amount of this salt in the saliva is too small to have any influence on the human being; while, in 1881, Pasteur and a score of other observers established the fact that the poisonous character of the saliva is due to the presence of a group of microörganisms, which have been designated as the micrococci of sputum-septicemia.

Since 1881 a great many have occupied themselves with investigations relating to this subject, and have met with no less than thirty-two different species of microörganisms of a pathogenic character in the human mouth, some of them having most virulent properties, besides a large number of organisms which are not pathogenic.

One of the most common results of bacterial action in the human mouth is caries of the teeth. We have not time to enter into a discussion of this process; photomicrographs that I shall demonstrate can scarcely leave any question as to the nature of the process.

A second result is the inflammation of the pulp of the tooth (pulpitis), one of the most common causes of toothache. It is a great mistake to look upon pulpitis as a disease of very trivial nature, because apart from the intense suffering caused by it, and apart from the possible, or often probable, loss of the tooth, it not infrequently incapacitates the patient for the time being for any kind of labor, and when it occurs, as is too often the case, in connection with other disturbances—during gravidity, confinement, or protracted illness—it becomes a disturbing factor of no mean order.

The inflammation of the dental pulp, if left to itself, will almost invariably be followed by suppuration, and eventually by the death of the organ. Putrefaction then sets in, and the pulp soon becomes converted into a putrid, stinking mass, which contains substances (ptomaïns) of an exceedingly toxic nature.

If but a minute portion of such a pulp is forced through the apical foramen it almost invariably gives rise to intense inflammation of the pericementum or lining membrane of the root. The tooth becomes intensely sore; considerable edema sets in; swelling of the cheek and lips, and frequently general symptoms, such as fever and chills, are present, which indicate that a certain amount of the poisonous product has been taken into the system. Usually the inflammation ends in the formation of an abscess, and the pus escapes through the external lamella of the alveolar process into the mouth. Occasionally it finds its way into the antrum or nasal cavity, or escapes externally at the angle of the jaw, under the chin, on the breast, in the arm-pit, etc. After discharge of the pus the process usually assumes a chronic character, and may give rise to no marked symptoms for years, more or less pus, however, escaping constantly or at intervals through the fistulous opening.

These alveolar abscesses are by no means infrequently the cause of secondary complications of a most serious nature; periostitis, osteomyelitis, caries, and necrosis of the bones being some of the most common results of infections orginating in gangrenous or putrid tooth-pulps. Koehler, director of the Charité Hospital in Berlin, observed no less than forty-four cases of this nature in two years. Many cases have been reported in which these processes have terminated fatally through the intervention of septicemia or meningitis, less frequently through edema of the glottis, pneumonia, etc.

A few cases may serve to give an idea of the varied course which the process may take.

CASE I.—A child, four-and-a-half years old, with carious teeth in the lower jaw and suppuration in the inferior dental canal, periostitis and ostitis of the vault of the skull, developed general pyemia, death taking place in nine days.

CASE II.—In a workman, thirty-six years old, abscesses of some of the teeth of the lower jaw were followed by osteomyelitis, phlegmon, periostitis purulenta, mediastinitis, pleuritis, and pericarditis, death taking place twenty-four hours after the appearance of the phlegmon.

CASE III.—A boy, eight years old, had an abscess of the right inferior first molar tooth, followed by suppuration, edema, necrosis, gangrene, sepsis, and death in twelve days.

CASE IV.—A boy, nine years old, had abscessed teeth in the right lower jaw, followed by periostitis purulenta, necrosis of the entire side of the jaw, sepsis, and death.

CASE V.—A man, forty-eight years old, had abscessed incisors in the lower jaw, followed by osteomyelitis, necrosis, laryngitis, and death.

CASE VI.—A woman, twenty-six years old, had an abscess of the right inferior first molar, followed by osteomyelitis and necrosis of the condyloid process.

CASE VII.—A girl, fifteen years old, had an abscess of the right inferior first molar, followed by ostitis and periostitis mandibulæ dextræ, endocarditis, pleuritis, nephritis, broncho-pneumonia, and death in four-and-a-half months.

CASE VIII.—A diseased tooth in the upper jaw led to inflammation of the antrum, caries of the ethmoid, abscess of the orbit, arachnitis, encephalitis, and death.

The foregoing cases are sufficient to show *some* of the complications arising from diseased teeth. A long list of such cases will be found in the second German edition of my work on *Mikroorganismen der Mundhöhle*, as well as in the *Dental Cosmos* for 1891, p. 706.

A further complication of abscessed teeth that gives much food for thought is illustrated by the following case: A sickly boy, nine years of age, suffering from an large abscess of the right inferior molar, accompanied by periostitis, on attempting to get up, fell from his bed, slightly bruising his thigh. The bruise became the seat of a secondary abscess, the pus of which had the same character and contained the same microörganisms as that discharged by the abscess of the tooth. A large number of similar cases have been reported—cases of acute or chronic pyemia in which abscesses in various parts of the body have been caused by diseased teeth. Baker relates a case in which an abscess on the big toe was cured by the treatment of a suppurating molar. These cases are easily accounted for. From the abscess of the tooth not only are toxic substances constantly

being absorbed, but also pathogenic bacteria from time to time find their way into the circulation, to be redeposited again, and to proliferate anew wherever, at the time being, they may find a *locus minoris resistentiæ*. While, therefore, a focus of chronic suppuration in the jaw may apparently produce no evil beyond the local symptoms, we can never tell but that it may be preparing or keeping up some process in some remote part of the body. Fürbringer puts it very well when he makes the assertion that many of these obscure cases that we are obliged to record as "unknown mycoses" will undoubtedly be traced to their origin when we come to properly appreciate the importance of a thorough understanding of the human mouth as a focus of infection.

Let me call your attention, in the next place, to a condition very commonly met with among the lower classes, and indeed often enough among well-to-do-people, which might be designated as total decay of the teeth. We find nearly every tooth in the mouth more or less decayed, many of them completely broken down, with exposed pulps or abscessed roots, and swollen, suppurating gums. Mastication of food is entirely out of the question, while quantities of pus and bacteria are swallowed with every meal, a condition of affairs to which an attack of measles or scarlet fever were, in my opinion, decidedly preferable. The recent examinations of the teeth of schoolchildren have made some startling revelations in this line. Then, again, we often have in the mouths of uncleanly persons a condition brought about by the action of fermenting and putrefying matter upon the mucous membrane which I have likened to a "spoiled stomach," and designate as spoiled mouth. As early as 1656 Pfaff called attention to the fact that loss of appetite, nausea, etc., are often erroneously attributed to the innocent stomach, when the cause was to be found in the filthy condition of the mouth. Von Kaczorowski has furnished us with very interesting data in support of this view.

The causal relation of diseased teeth, particularly of teeth with putrescent pulps, to chronic swelling of the lymphatic glands in the region of the lower law and neck has been clearly established by Odenthal, who found glandular swellings in ninety-nine per cent. of all children who suffered from badly decayed teeth, and only in forty-nine per cent. of those with sound teeth.

A further condition in which bacterial processes are involved is that known as pyorrhœa alveolaris, in which more or less profuse suppuration takes place about the necks or roots of the tooth, involving the bony socket. The teeth gradually loosen and eventually fall out. Apart from the loss of the teeth, the constant swallowing of pus from such teeth is not to be regarded as a matter of indifference. On n'absorbe pas impunément pendant des mois et des années, des sécrétions purulentes, contenant des agents aussi infectieux que ceux de la pyorrhée alvéolaire. (Gallipe.)

The question of pyorrhœa aveolaris has excited unusual interest recently on account of its supposed connection with the uric-acid diathesis. It remains for the future to definitely determine in how far this affection actually depends upon the uric diathesis for its origin.

The tonsils have already received a great deal of attention as harbingers of pathogenic germs. It is a fact generally recognized that various pathogenic germs, among others even the bacillus of diphtheria and the ray-fungus (actinomyces), may vegetate in the lacunæ of the tonsils without producing any serious symptoms as long as the general health of the person is good, and no lesion or other point of diminished resistance is formed in the tonsils or mucous membrane of the throat. Otherwise an infection is liable to occur at any time.

The literature of this subject is already very extensive and exceedingly instructive, but we have not the time to enter into a further discussion of it.

Another disease of the mouth of parasitic origin is *thrush*. You are all acquainted with its nature and treatment. I will merely state that this is the only disease of the mouth, and in fact of the human body, which is caused by a yeast-fungus. The view formerly held, and still commonly met with in medical journals, that we have here to do with a mold-fungus, has been shown to be untenable.

It is well known that the prolonged administration of mercury or its compounds brings about an affection known as stomatitis mercurialis, the symptoms of which are familiar to you all. Very careful and reliable observations by Gallipe, which have been confirmed by Ritter, leave little doubt that these symptoms are in a great measure due to the action of bacteria upon tissues that had been rendered more susceptible to their action by the influence of the mercury. If the mouth is put in a perfect hygienic condition, as it always should be before the mercurial treatment is begun, much of the trouble arising from this source will be avoided.

Actinomycosis is still another bacterial affection, very often terminating fatally, in which the point of entrance is usually to be found in the mouth.

Of two-hundred-and-twenty-five cases, one-hundred-and-twenty-eight were found to have originated in the jaws, defective teeth most commonly furnishing the *locus minoris resistentiæ*. Of the remaining one-hundred cases many were primary infections of the lungs and alimentary tract, in which, again, the germs entered the body through the mouth.

The relation of mouth-germs to affections of the middle ear (otitis media) merits particular attention. Fifty-four cases have been reported by Maggiore and Gradenigo in which they found the micrococcus of sputum-septicemia twenty-eight times, staphylococcus pyogenes albus eight times, staphylococcus pyogenes flavus five times, and streptococcus pyogenes eight times; all of these being microörganisms very commonly met with in the mouth. They found, moreover, in eighty per cent. of these cases examined, the same germs in the secretions of the mouth and nose as in those of the middle ear. According to Zaufal the microörganisms find their way into the middle ear through the tuba Eustachii. Inflammation of the salivary glands has been shown by various observers to be frequently brought about in a similar manner, bacteria penetrating from the mouth through the ducts of those glands.

It has been established beyond all doubt that the specific cause of croupous pneumonia lies in a micro-organism or group of microörganisms that can readily be found in the mouths of the majority of all persons. It is the same group that was referred to in the beginning of these remarks as the chief cause of the toxic action of human saliva, variously designated as micro-

coccus of sputum-septicemia, pneumococcus, meningococcus (from its frequent causal connection with meningitis), etc. Many experiments and observations have been reported which render it highly probable that the infection in case of pneumonia does not take place directly from the air, because the specific microörganisms soon loose their virulence or even vitality in the air. Furthermore, it has been pretty well established that in the breathing of air that contains moderate numbers of microörganisms, the latter lodge in the mouth, nose, and throat, and do not reach the lungs in sufficient number to be able to bring about an infection. It is much more probable that the infection takes place directly from the mouth by particles of saliva or mucus loaded with germs being carried into the lungs in forced inspiration, as in coughing. Whether this act would be followed by the development of croupous pneumonia or not would, of course, depend upon the susceptibility of the lungs or any part of them at the time being. This same group of microörganisms has furthermore been met with in parotiditis, multiple subcutaneous abscesses, tonsillitis, otitis media, pleuritis, endometritis, peritonitis, pericarditis and endocarditis, abscesses of the mastoid process, and retro-pharyngeal abscesses, meningitis, etc.

I find that I have already overrun the time set apart for these few introductory remarks; I shall, therefore, only mention some of the other affections that demand consideration in this connection, such as stomatitis gangrænosa and aphthosa, stomatomycosis, foot-and-mouth-disease, and, particularly, those general diseases that originate in the mouth, or, at least, produce marked local manifestations there, such as syphilis, tuberculosis, diphtheria, influenza, etc., in all of which the thorough and intelligent care of the mouth is imperative in the highest degree.

The foregoing, which is only a mere outline of the subject, may suffice to show what an extensive influence the condition of the mouth exerts in determining the general state of health of the whole body, and how imperative it is that every one practising medicine or any branch of it should be thoroughly informed in regard to this question. It furthermore, in my opinion, justifies the statement that stomatology, or that branch of medical science which has to do with the diseases of the human mouth and their treatment, is perfectly entitled to stand on an equal level with the other specialties of medicine: otology, ophthalmology, etc.

A demonstration was then made by means of photomicrographs projected upon the screen by the lantern, showing in detail the morphology of the several groups of pathogenic bacteria that inhabit the human mouth.

A full set of slides, illustrative of the author's investigations upon the etiology of dental caries, was exhibited, showing bacteria *in situ* in normal caries and also in that artificially produced by subjecting sound dentin to the action of pure cultures of the specific microörganisms concerned in the production of the disease.

A most interesting slide was one taken from a section of the kidney of a mouse that had been inoculated with the thrush-fungus. The section showed the bacterium *in situ* with inflammatory reaction set up by its presence, thus demonstrating conclusively the power possessed by the thrush-fungus of inducing metastatic inflammatory processes.

The remainder of the demonstration consisted of an exhibit of mouth-bacteria that have been described in detail by the author in several contributions to the *Dental Cosmos* and are embodied in his work, *Die Microörganismen der Mundhöhle.*

CORRESPONDENCE.

THE TREATMENT OF APPENDICITIS.

To the Editor of THE MEDICAL NEWS,

DEAR SIR: In the clear and emphatic article of Dr. John B. Deaver, entitled, "Further Observations upon the Etiology, Diagnosis, and Treatment of Acute and Chronic Appendicitis," etc., he says (p. 592), the diagnosis having been made, "I at once administer a purgative, preferably castor-oil or salts. If this is not retained I give calomel. If, after the purgative has operated satisfactorily, the symptoms continue along with an increase of intensity of the localized tenderness, I at once operate."

The doctrine maintained is, therefore, this: the diagnosis established, purgation; no amelioration—operation. From this I dissent. A limited experience in private practice has led to the conclusion that medicinal purgation in appendicitis is harmful; that thereby the symptoms are surely aggravated; that the patient always grows worse after taking a purgative, which he is very likely to do on his own responsibility in the outset of the attack.

The formula for medical treatment should be rest, topical applications, rectal enemata. Rectal enemata may be repeated every hour or two until the bowels act freely, if necessary, to the number of twenty.

Finally, the selection of proper surgical cases of appendicitis is a subject for the display of the finest judgment and reasoning. A death without operation is lamentable; complete recovery, patient declining operation, mortifying to its advocate.

LOUIS KOLIPINSKI.

WASHINGTON, D. C.

TESTIMONIAL TO SIR JOSEPH LISTER.

To the Editor of THE MEDICAL NEWS,

SIR: Sir Joseph Lister having recently retired from active hospital and teaching work, the occasion has been thought appropriate for presenting him with a testimonial of the esteem in which he is held by his former colleagues and pupils, and committees have, therefore, been formed in Glasgow, Edinburgh, and London for the purpose of raising the necessary funds.

It is proposed that the testimonial shall take the form of a portrait. Subscriptions have been limited to two guineas (about $10.23), and it is hoped that sufficient funds will be collected to permit of some memento of the occasion being presented to each subscriber of that amount.

As there are probably many surgeons in the United States who may wish to join in the movement, but whose names and exact addresses it has been difficult to ascertain, I should be glad if you would permit me to state that subscriptions may be sent to me at 29 Weymouth

Steeet, Portland Place, London W., England, or to one or other of the following gentlemen, who have kindly consented to act as treasurers, viz.: Dr. James Finlayson, 4 Woodside Place, Glasgow, Scotland; Prof. Chiene, 26 Charlotte Square, Edinburgh, Scotland; Prof. William Rose, 17 Barley Street, London, W., England; Dr. Malloch, 124 James Street, South, Hamilton, Ont., or J. Stewart, M.B., 37 South Street, Halifax, Nova Scotia.

I have the honor to remain, sir,

Yours faithfully,

J. FREDERICK W. SILK,

Honorary Secretary.

NEWS ITEMS.

Foot-ball Incidents.—The events of the past week have most thoroughly discredited the game of foot-ball as at present played. The contest at Springfield between the Yale and Harvard teams was one of the most unwholesome performances that ever masqueraded under the name of amateur sport. Players slugged into unconsciousness, eyes nearly gouged out, brains concussed, disabling sprains and bruises constantly interrupted the progress of the game, which even an ex-ball-player and friend of the sport declares to have been characterized by "sickening brutality." Besides this we hear of a student made insane through injuries received in playing, and two fatal accidents are reported. The number of young men who are permanently injured and who go through life more or less crippled in consequence of foot-ball playing can never be known. We should be sorry to see foot-ball abolished altogether from our colleges. There is no game that equals it in many ways when played as a manly sport and not for gate receipts. But the new rules are plainly ineffective, and unless some change can be made, the game really deserves to be placed under the supervision of boards of health working in coöperation with an efficient police.—*Medical Record.*

In a saloon in San Francisco in a quarrel over a foot-ball game, a foot-ball player was shot, perhaps fatally. The saloon in which the affray occurred was crowded with college students feverishly discussing the game. Loughborough, who is a law student, has University of California affiliations, and after some offensive remarks by Whitehouse, the men attacked one another. Glasses were smashed and chairs were used as weapons before they could be separated. Loughborough's nose was bleeding, and he drew his revolver, firing three shots at Whitehouse, one bullet lodging in his abdomen.

"This talk of stopping the game if it gets rough," said an old Yale player, "is the veriest rot. Superintendent Brynes would have to summon his whole force, and the Governor would be compelled to call out the militia to stop this game. Foot-ball players are not easily bluffed."

A letter protesting against the disorderly conduct of the students after the foot-ball match Thanksgiving Day in San Francisco has been forwarded to the presidents of the University of California and the Stanford University by the saloon-keepers of that city. The students overran the city, breaking chairs and glasses in beer-halls and saloons and terrorizing saloon-men. The police were unable to control them.

Three Yale and Princeton students were arrested after the game in New York, December 1, for drunkenness.

Charles Jones, the youth who sustained a fracture of the skull on Thursday, while playing foot-ball at Camden, N J., was still unconscious last night. It is thought that he will die.

A foot-ball game between a team of college men and the town men of Kirkwood, Mo., Thursday, resulted in the serious and possibly fatal injury of Philip Gauss, quarter-back of the college men's team. He was the under man in a scrimmage, and his physician reports him badly injured internally.

The condition of Bahen, the captain of the Georgetown College foot-ball eleven, who was so seriously hurt in the game with the Columbia Athletic Club on Thanksgiving Day, remains about the same. His spine is fractured, and the pressure on the spinal cord has produced paralysis from the chest down. He will be moved from the College Dispensary to-morrow and be taken to a hospital, where an effort will be made to remove the fractured pieces of bone. The operation is to be made as a last resort, and his recovery is doubtful.

The expenses of one foot-ball team (Yale) for one year (1892) were $15,284.62 and the gross receipts $31,300.71, leaving the net receipts $16,016.09. The net receipts last year were for the same team, $22,914. In 1892 the team paid for drugs, surgical supplies, medical services, and rubbers, $857.89.

Prize of the American Neurological Association.—The American Neurological Association offers a prize of $200 for the best essay on any subject connected with neurological science.

This competition is open to *physicians* who are legal residents of States in North and South America.

Essays must be sent to the Secretary of the Association, Dr. Græme M. Hammond, 58 West Forty-fifth Street, New York City, on or before the tenth day of May, 1895.

Each essay shall be accompanied by a sealed envelop containing the name and address of the author, and bearing on the outside a motto, which shall also be inscribed upon the essay.

Essays shall be type-written, in either the English or French language, and with the pages securely fastened.

The Council of the Association reserves the right to reject any or all essays judged unworthy of the award.

Each essay must exhibit original research, and none will be accepted that has previously been published.

The Antitoxin Treatment of Diphtheria.—A reaction against the unmeasured claims advanced for the curative effects of Professor Behring's diphtheria-serum is setting in rather seriously. The most significant utterance in this respect was made at a meeting on Wednesday, November 28th, at the Berlin Medical Society, when Dr. Hansemann, an assistant in Professor Virchow's Pathological Institute, as the mouthpiece of Professor Virchow himself, sharply criticised in detail Professor Behring's serum-therapeutics. He denied that the serum immunizes human beings, and declared that no sufficient

proof had been produced respecting its curative properties. Furthermore, Dr. Hansemann claimed that the effects of serum-treatment in many cases were dangerous to health and even to life. The statistics thus far obtainable of the results of the serum-treatment, he pronounced to be unreliable and often misleading.—*Newspaper Report.*

Antitoxin for New York.—It is announced that pending action of the New York Board of Estimate and Apportionment upon the application of the Board of Health for an appropriation of $30,000 to enable the Board to prepare the antitoxin of diphtheria, and carry on its scientific work, an anonymous philanthropist has furnished the means for the inoculation of a number of horses, sheep, goats, and dogs with diphtheria for the purpose of obtaining the antitoxin. It is proposed first to supply the Willard Parker and the North Brother Island Hospitals and then the general profession.

French Congress of Surgery.—The next French Congress of Surgery will be held October 21, 1895. The following subjects will be considered: 1. Surgery of the Lung (not including the pleura); 2. Early or Late Operative Intervention for Solutions of Continuity in Bones (not including the skull).

Correction.—Dr. Deaver wishes correction made of a typographic error in the title of his article in THE NEWS of December 1st. Instead of "Professor of Surgical Anatomy, etc.," read "Assistant Professor, etc."

The Colorado Climatologist and Denver Medical News is the name of a new journal published monthly at Denver, Col., and edited by Dr. C. Manly and J. N. Hall, together with a list of collaborators.

An Addendum to the article of Dr. MacPhail in the present number of THE NEWS, received too late for insertion, will appear in the issue of next week.

BOOKS AND PAMPHLETS RECEIVED.

Treatise on Diphtheria. By H. Bourges, M.D. Physician's Leisure Library. Detroit: George S. Davis, Publisher, 1893.

Asepsis in Minor Procedures. By Hunter Robb, M.D. Reprinted from the Maryland Medical Journal, 1894.

Notes on Gynecological Technique. By Hunter Robb, M.D. Reprinted from the New York Journal of Gynecology and Obstetrics, 1894.

Practical Application of the Principles of Sterilization. By Hunter Robb, M.D. Reprinted from the American Journal of Obstetrics, 1894.

An Operating Table. By Hunter Robb, M.D. Reprinted from the Johns Hopkins Hospital Bulletin, 1894.

Railway Spine. By Clark Bell, Esq. Pamphlet. New York, 1893.

Leukemia in Infants. By John Lovett Morse, A.M., M.D. Reprinted from the Boston Medical and Surgical Journal, 1894.

La Femme et la Bicyclette. Par le Dr. Just Championnière. Extrait de la Revue du Touring Club, Paris.

Chungking Hospital of the Methodist Episcopal Church. Second Annual Report, 1893. Kiukiang: The Central China Press.

De l'Agrandissement Momentané du Bassin. Rapport lu au Congres International des Sciences Médicales tenu à Rome, du 29 Mars au 5 Avril, 1894. Par Adolphe Pinard. Paris: G. Steinheil, 1894.

A Post-Graduate Lecture on Further Researches on the Causation of Anemia and the Blood-Changes Produced by Uric Acid. By A. Haig, M.A., and D.M. Oxon., F.R.C.P. Lond. Reprinted from the British Medical Journal, 1894.

The Human Element in Sex. Being a Medical Inquiry into the Relation of Sexual Physiology to Christian Morality. By Dr. Elizabeth Blackwell. New Edition. London: J. & A. Churchill, 1894.

A System of Genito-Urinary Diseases, Syphilology and Dermatology. By Various Authors. Edited by Prince A. Morrow, A.M., M.D. With illustrations. In three volumes. Vol. III. Dermatology. New York: D. Appleton & Co., 1894.

Some Observations on Gonorrhea in the Male. By W. F. Arnold, M.D. Reprinted from the Southern Practitioner, 1894.

Two Cases of Unclassified Infection. By W. F. Arnold, M.D. Reprinted from the Occidental Medical Times, 1894.

A Brief Consideration of the Cases of Appendicitis Occurring in the Practice of Professor William H. Carmalt. Being a Report to the Committee on Matters of Professional Interest of the Connecticut State Medical Society for 1894.

Differential Diagnosis of Alcoholic Coma from other forms of Coma, with Especial Reference to the Care of Persons found by the Police on the Streets in a Comatose or Semi-Comatose Condition. By Lewis D. Mason, M.D. Reprinted from the Quarterly Journal of Inebriety, 1894.

Some Observations on an Epidemic of Typhoid Fever. By L. D. Pierce Clark, M.D. Reprinted from the Medico-Surgical Bulletin, 1894.

Primary Carcinoma of the Gall-Bladder. By Delano Ames, M.D. Reprinted from the Johns Hopkins Hospital Bulletin, 1894.

Lectures on Rectal and Gastro-Intestinal Surgery, with Demonstrations. II. A Modification of Kraske's Method of Excision of the Rectum. III. A Tunnelled Fistulatome. IV. Gastro-Enterostomy made within Two Minutes without Suture, Ligature, or Forceps, with a Modifiction of the Murphy Button. By H. O. Walker, M.D. Reprinted from Mathews' Medical Quarterly, 1894.

A Report of Two Cases of Brain-Tumor, with Autopsies. By Irwin Neff, M.D. Reprinted from the American Journal of Insanity, 1894.

A Case of Primary Tuberculosis of the Female Bladder. Diagnosed and Treated by Howard Kelly's New Method of Direct Inspection with Large Endoscopes. By W. L. Burrage, M.D. Reprinted from the Boston Medical and Surgical Journal, 1894.

First Annual Report upon the Births, Marriages, Divorces, and Deaths in the State of Maine, for the Year ending December 31, 1892. Augusta: Burleigh & Flint, Printers to the State, 1894.

How to Cure the Profound Deafness of Chronic Aural Catarrh. By Robert Barclay, A.M., M.D. Reprinted from the Courier of Medicine.

Closure of the Ear by Growths of Bone; Purulent Inflammation of the Middle Ear; Pain, Deafness, etc.; a Fourth Case of the Writer's Successfully Treated by Osteotomy; with Cure. Description of Operation, Instruments, etc. By Robert Barclay, A.M., M.D. Reprinted from the Medical Review, 1894.

A Text-book of Practical Therapeutics, with Especial Reference to the Application of Remedial Measures to Disease and their Employment upon a Rational Basis. By Hobart Amory Hare, M.D, B.Sc. Fourth edition, enlarged and thoroughly revised. Philadelphia: Lea Brothers & Co., 1894.

What Dr. Browning Knows of Homeopathy. By Harvey Dale, M.D. Reprinted from the Medical Century.

Baron von Langenbeck, Surgeon-General of the German Army, Professor of Surgery in the University of Berlin. By Walter B. Platt, M.D. Reprinted from the Johns Hopkins Hospital Bulletin, 1894.

Some Account of Baron Larrey, Surgeon of the Armies of France under Napoleon the First. By Walter B. Platt, M.D., F.R.C.S. Reprinted from the Maryland Medical Journal, 1894.

Notes on the Anderson Process Compared with Ordinary Sand-Filtration. By E. Devonshire. London: Walter F. Morgan, 1894.